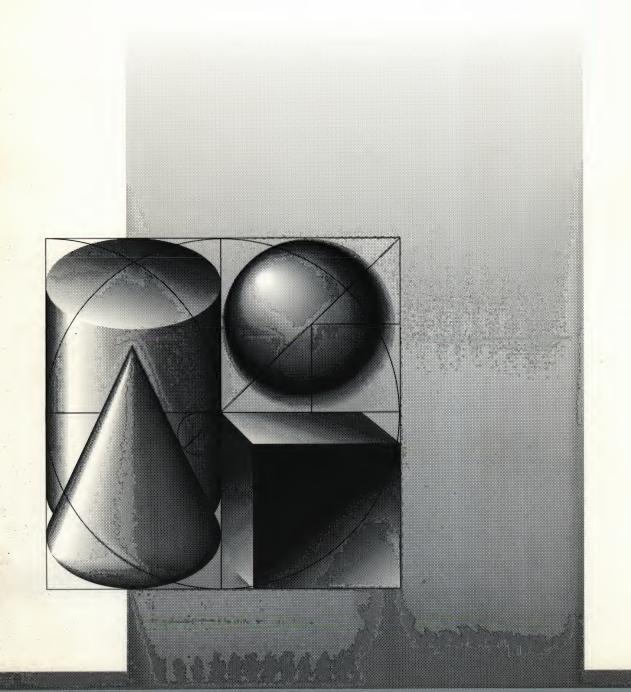


# **Communication Tools** Basic Connectivity Set Version 1.0B15 APDATM # M0379LL/A



Apple Computer, Inc. 20525 Mariani Avenue Cupertino, California 95014 (408) 996-1010 TLX 171-576

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### Communications Toolbox - Programmer's Notes

#### **Abstract**

The Communications Toolbox tools provide a consistent way for users to configure their communications setups. Via user-friendly dialogs, users can choose and set various communications parameters. The Communications Toolbox also allows programs to set the same parameters without forcing the user to go through the dialogs.

This document contains the programmer's information for those parameters for various Apple Communications Toolbox tools. It lists the various values for the tools' GetConfig() and SetConfig() configuration string routines. The possible values are shown in the angle brackets.

#### **Revision History**

First Draft

16 November 1989

Macintosh DTS

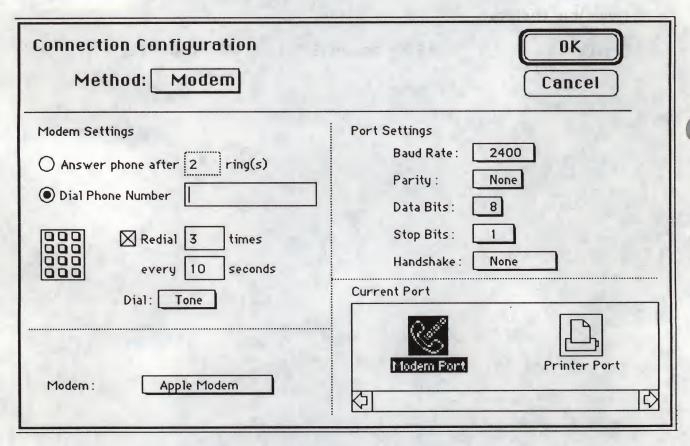
### Modem Connection Tool - Programmer's Notes

This section contains programmer's information for the Apple Modem Connection Tool for the Macintosh Communications Toolbox.

### Script Interface

#### **Configuration Strings**

The connection tool provides a script language interface where the connection tool configuration can be set through a Communications Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.



The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.

<numeric (appropriate values) > BitsPerChar <5 | 6 | 7 | 8 > Parity <None | Even | Odd > StopBits <1 | 1.5 | 2> <"Modem Port" | "Printer Port" | other... > Port Handshake <none | Xon/Xoff> HoldConnection <TRUE | FALSE > RemindDisconnect<TRUE | FALSE > PhoneNumber "the phone number" Dial <TONE | PULSE | MIXED> Retry <TRUE | FALSE> RetryLimit <numeric> RetryInterfval <numeric> TypeOfCall <Originate | Answer> NumberRings <numeric> ModemType <Apple | Other>

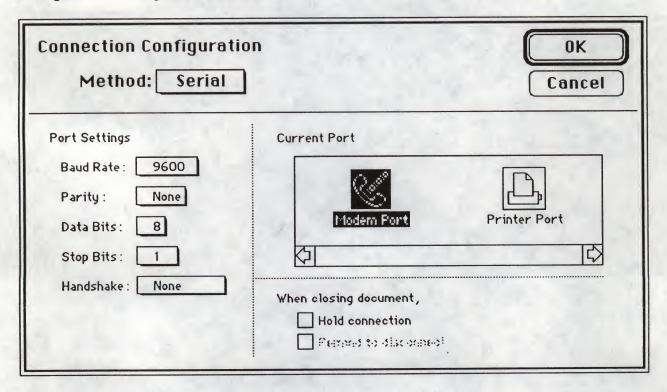
### Serial Connection Tool- Programmer's Notes

This section contains programmer's information for the Apple Serial Connection Tool for the Macintosh Communications Toolbox.

### Script Interface

#### Configuration Strings

The connection tool provides a script language interface where connection tool configuration can be set through a Communications-Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.



The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.

# Teletype Terminal Tool- Programmer's Notes

This section contains programmer's information for the Teletype Terminal Tool for the Macintosh Communications Toolbox.

### Script Interface

#### Configuration Strings

The terminal tool provides a script language interface where terminal configuration can be set through a Communications Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.

Terminal Configuration  Emulation: TTY		OK Cancel
OG On Line	Text Cursor  Block  Underline	
Width: 80 Columns Size: 9 point	Scroll Text  ① Jump   ○ Smooth	
Characters  Auto Wrap to next line  Show Control Characters	This is a sample of T This is a sample of T	
Holding down keys will  Auto Repeat Keys  Repeat Control Keys	This is a sample of T  Swap 'backspace' and 'delete'  New Line on a return	

The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.

FontSize	<9   12>
Width	<80   132>
Cursor	<block underline=""  =""></block>
Online	<true false=""  =""></true>
LocalEcho	<true false=""  =""></true>
AutoRepeat	<true false=""  =""></true>
RepeatControls	<true false=""  =""></true>
AutoWrap	<true false=""  =""></true>
NewLine	<true false=""  =""></true>
Scroll	<jump smooth=""  =""></jump>
ShowControls	<true false=""  =""></true>
SwapBackspaceDelet	e <true false=""  =""></true>

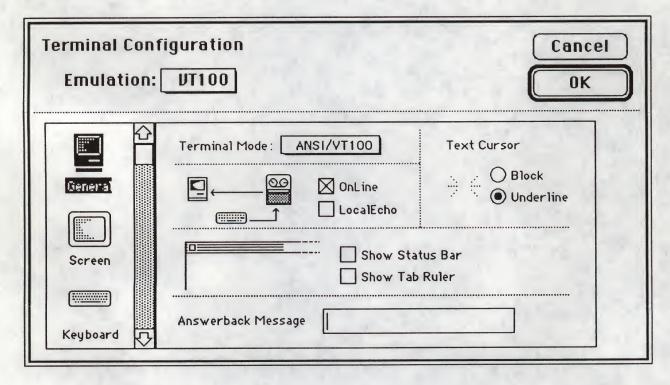
### VT100 Terminal Tool - Programmer's Notes

This section contains programmer's information for the Apple VT10x Terminal Tool for the Macintosh Communications Toolbox.

### Script Interface

#### Configuration Strings

The terminal tool provides a script language interface where terminal configuration can be set through a Communications Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.



The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.

TerminalMode	<vt100  vt52=""></vt100 >
Online	<true false=""  =""></true>
LocalEcho	<true false=""  =""></true>
Cursor	<block underline=""  =""></block>
ShowStatusBar	<true false=""  =""></true>
ShowTabRuler	<true false=""  =""></true>
Answerback	"<20 characters>"
Width	<80   132>
FontSize	<9   12>
Scroll	<jump smooth=""  =""></jump>
AutoWrap	<true false=""  =""></true>
InsertChar	<true false=""  =""></true>
ShowControls	<true false=""  =""></true>
OriginAtMargin	<true false=""  =""></true>
InverseVideo	<true false=""  =""></true>
	and the second second second second
Keypad	<numeric application=""  =""></numeric>
CursorKey	<ansi application=""  =""></ansi>
AutoRepeat	<true false=""  =""></true>
RepeatControls	<true false=""  =""></true>
Keyclick	<true false=""  =""></true>
NewLine	<true false=""  =""></true>
SwapBackspaceDelet	
KeyboardLocked	<true false=""  =""></true>
	Average Company
ActiveCharSet	<g0 g1=""  =""></g0>
G0	<character set=""></character>
G1	<character set=""></character>
G2	<character set=""></character>
G3	<character set=""></character>

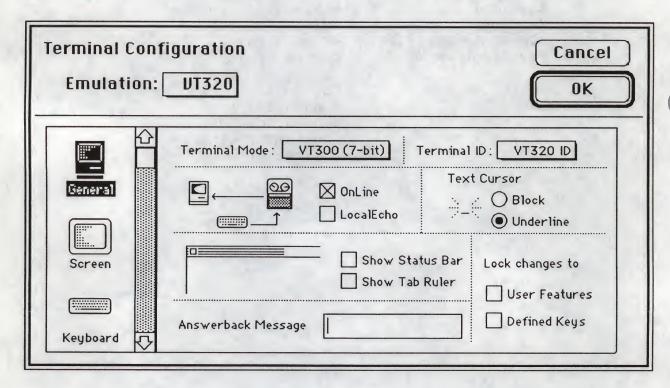
### VT320 Terminal Tool - Programmer's Notes

This section contains programmer's information for the Apple VT320 Terminal Tool for the Macintosh Communications Toolbox.

### Script Interface

#### Configuration Strings

The terminal tool provides a script language interface where terminal configuration can be set through a Communications Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.



The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.

```
TerminalMode
                             < VT300 (7-bit) | VT300 (8-
bit) | VT100 | VT52>
      TerminalID
                             < T320ID | VT100ID | VT101ID |
VT102ID | VT202ID>
      Online
                             <True | False>
      LocalEcho
                             <True | False>
      Cursor
                             <Block | Underline>
      ShowStatusBar
                             <True | False>
      ShowTabRuler
                             <True | False>
      Answerback
                             "<30 characters>"
      UserKeysLocked
                             <True | False>
      UserFeaturesLocked
                             <True | False>
      Width
                             <80
                                    | 132>
      FontSize
                             <9
                                    1 12>
      Scroll
                             <Jump | Smooth>
      AutoWrap
                             <True | False>
      InsertChar
                             <True | False>
      ShowControls
                             <True | False>
      OriginAtMargin
                             <True | False>
      InverseVideo
                             <True | False>
      StatusLine
                             <Visible | Hostwritable>
      Keymapping
                             "<name>" e.g. "VT320"
      Keypad
                             <Numeric | Application>
      CursorKey
                             <ANSI | Application>
      AutoRepeat
                             <True | False>
      RepeatControls
                             <True | False>
      Keyclick
                             <True | False>
      NewLine
                             <True | False>
      SwapBackspaceDelete
                             <True | False>
      KeyboardLocked
                             <True | False>
      GL
                             <G0 | G1 | G2 | G3>
      GR
                             <G1 | G2 | G3>
      G0
                             <character set> e.g USASCII
      G1
                             <character set>
      G2
                             <character set>
      G3
                             <character set>
      PreferredSet
                             <DecSupplement | ISOLatin>
```

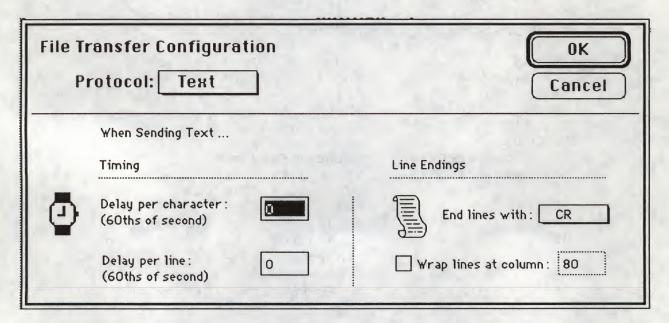
### TEXT File Transfer Tool - Programmer's Notes

This section contains programmer's information for the Apple Text File Transfer Tool for the Macintosh Communications Toolbox.

### Script Interface

#### **Configuration Strings**

The file transfer tool provides a script language interface where file transfer configuration can be set through a Communications Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.



The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.

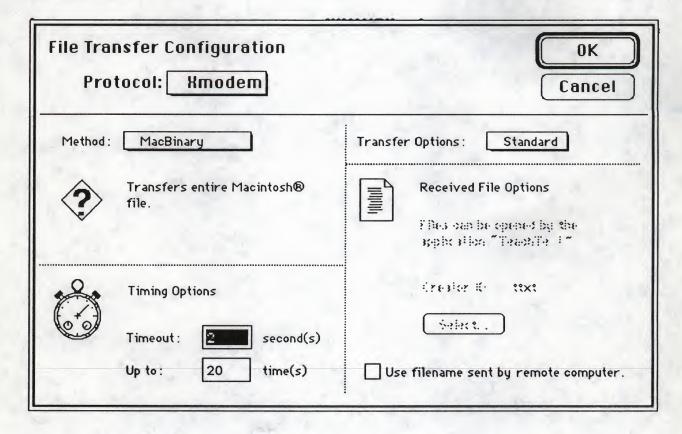
### XMODEM File Transfer Tool - Programmer's Notes

This section contains programmer's information for the Apple Xmodem File Transfer Tool for the Macintosh Communications Toolbox.

### Script Interface

#### Configuration Strings

The file transfer tool provides a script language interface where file transfer configuration can be set through a Communications Toolbox call rather than by opening the dialog. The string is made up of string pieces that match the controls in the configuration dialog shown below.



The following are the configuration strings used by the tool's GetConfig(), SetConfig() routines. The possible values are in the angle brackets.



# SampleComm User Guide Communications Tools

Alpha Draft September 29, 1989

#### IMPORTANT NOTE

This document is supplied in its current, incomplete state to provide you with as much information as possible as early as possible. Although every attempt has been made to verify the accuracy of the information, this document may contain errors and is subject to change as the software it describes is still in development.

SampleComm is a sample Macintosh Communications Toolbox application that Apple Computer has developed internally. This early draft of Part II of the SampleComm User Guide is provided to show you how we envision the Communications Tools will be documented for end users.

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### Preface What's in this Document

This is your reference guide to the communications tools included with your SampleComm application. You can use this document to gain a basic understanding of what the communications tools are, of how to install them, and of the setup options associated with each of the tools. The instructions for actually using the tools are provided in the SampleComm User Guide (which precedes this document in your binder).

The first module in this guide, "About the Communications Tools," gives you an overview of the tools and presents any information that is pertinent to all of the tools, including installation instructions. The rest of the guide is divided into three sections:

- Terminal Emulation Tools
- Connection Tools
- File Transfer Tools

Within each section are modules on the communications tools for that category. Each tool module is an independent unit. If you aren't using a particular tool, you might want to remove the module on this tool and store it somewhere else. In addition, since Apple® Computer will continue to release new tools that can run with SampleComm, you can insert any new tool modules that you obtain in the appropriate section of this binder.

Some of the tool modules also include quick-reference cards (for keyboard conversions) that you can tear out and refer to as needed. <<Reviewers: these cards are not included in this draft.>>

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## **About the Communications Tools**

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The communications tools are files that provide the communications services you will be using with SampleComm. The tools fall into three categories:

terminal emulation tools determine the type of terminal that your

Macintosh will emulate during the

communications session

connection tools define the type of connection that is

established between your Macintosh and the

remote computer

file transfer tools control the protocol used to ensure that files are

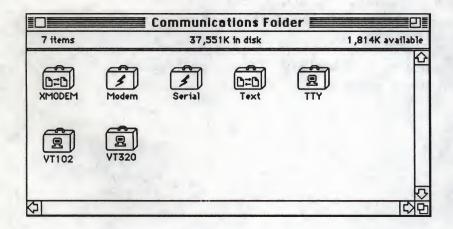
transferred intact

For each communications session, you will need a terminal emulation tool and a connection tool; frequently, you will also use a file transfer tool. For example, if you are establishing a communication session to transfer files between your Macintosh® and a DEC mainframe, you might use the VT320 terminal emulation tool (so that your Macintosh emulates this DEC terminal) and the Modem connection tool (to establish a compatible link between the two computers), as well as the XMODEM file transfer tool (to ensure that the files you transfer arrive without errors).

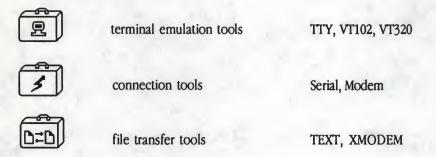
You can configure each tool for your particular communications environment by using SampleComm to change the communications parameters (the setup options) for the tool. For example, when you are using a terminal emulation tool, you can set the column width and type size, among other features, and when you are using a connection tool, you can specify such features as baud rate, parity, and handshake protocol.

### The tools included with SampleComm

Your SampleComm application includes a basic set of communications tools. After you install the tools, they reside in a folder labeled *Communications Folder* in your System Folder. If you install all of the communications tools included with your SampleComm application, the contents of the Communications Folder will look like the figure below.



These tools fall into the typical three categories:



You use the Settings menu in your SampleComm application to select and configure tools. If you do not change any of the settings, SampleComm automatically defaults to the following three tools:

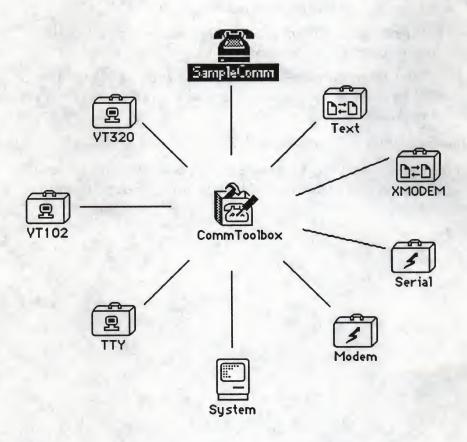
- VT102 terminal emulation
- Serial connection
- XMODEM file transfer

The setup options for all of the communications tools included with your SampleComm application are preset to the most common settings. Frequently, you won't need to change these settings. However, sometimes you may want to reconfigure the tools to better accommodate the type of communications environment that you are establishing. The tool modules in the rest of this document define the setup options associated with each of the tools included with your SampleComm application. Using the Settings menu, its easy to change the settings; you can experiment with various settings until you find the ones that work best for your environment. When you close a session document, the settings for the communications tools are saved with the contents of the document.

As new communications tools become available, you will be able to access many of them through SampleComm, simply by installing them on your Macintosh.

### The Macintosh Communications Toolbox

The communications tools work in conjunction with the Macintosh Communications Toolbox (CTB), which is a programming interface between SampleComm, the communications tools, and the Macintosh Operating System, as shown below.



### Installing the tools

Before using SampleComm, you will need to install the CTB and a set of communications tools in to your System Folder. In fact, SampleComm will not run unless the CTB and both a terminal emulation tool and a connection tool are available.

You can use the *Communications* disks that accompanied your SampleComm application to install the CTB and any of the communications tools included with SampleComm. The Installer program (found on the *Communications 1* disk) can be used in two ways:

Easy Install to install both the CTB and all of the communications tools included with

SampleComm at one time on your hard disk

Customize to tailor your installation—to install the CTB, a specified tool, a set of tools,

or any combination of these on your hard disk or on a floppy disk (or on a

combination of disks)

You need System version 6.0.2 or later in order to use this Installer.

The following sections provide instructions for using the Installer, as well as information about installing new communications tools that become available in the future from Apple Computer or from third-party developers.

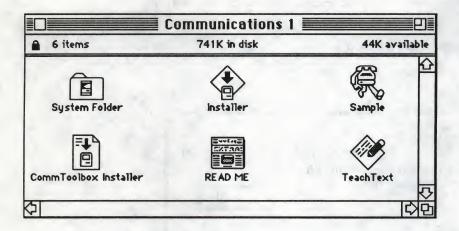
#### Installing the CTB and the full set of communications tools

The instructions in this section explain how to use the Easy Install option in the Installer program to install the CTB and the full set of communications tools included with SampleComm onto a hard disk.

When you are ready to begin, follow these steps:

- 1. If your Macintosh is on, save and quit from all applications and then choose Shut Down from the Special menu.
- 2. Insert the disk labeled *Communications 1* into a floppy disk drive and start your Macintosh.
- 3. Open the Communications 1 disk, by double-clicking on the disk icon that appears at the top right of your screen.

The disk opens and its contents is displayed.



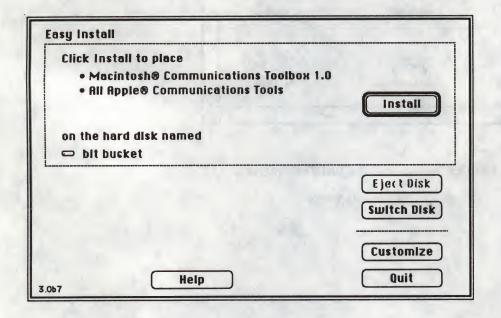
4. Double click the Installer icon to start the Installer program.

In a few moments, the Installer's opening display appears.



#### 5. Click OK to display the Easy Install dialog box.

The figure below is a sample of this box.



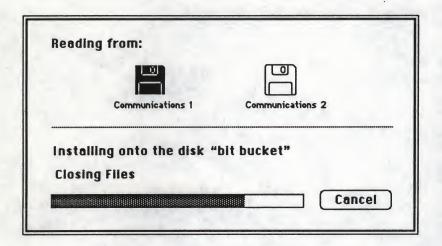
6. Make sure the disk indicated is the one onto which you want to install the CTB and tools. If not, click Switch Disk until the correct disk name appears.

#### △ Important

You can't install the CTB or the communications tools on the disk containing the Installer, on the disk you started up and are currently using, or on an AppleShare volume (file server).  $\triangle$ 

#### 7. Click Install.

The Installer displays a status box (shown below) that keeps you informed as the installation progresses.

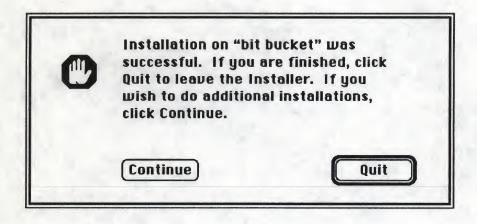


During the first few moments, you may halt the installation by clicking the Cancel button. However, once the Installer begins to delete old files, the Cancel button changes to a Stop button. As the installation continues, the Installer prompts you to insert the Communications 2 disk and then to reinsert the Communications 1 disk. If you click the Stop button to halt the installation, the Installer stops after installing the files from the current Communications disk.

#### ▲ Warning

When you use the Stop button to interrupt installation, some tools that were available before you began the installation may no longer be available (since the Installer begins by deleting all of the old files and then starts installing the new ones).  $\triangle$ 

When the installation process is complete, the Installer displays a message similar to the one shown below. If you open your System Folder, you will now find the CTB application icon and a folder labeled *Communications Folder* that contains the communications tools you have just installed.



- 8. Choose Quit.
- 9. Choose Restart from the Special menu to eject the Communications 1 disk and to reboot your Macintosh.

The CTB and the communications tools are ready to use with SampleComm.

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#### Customizing your installation

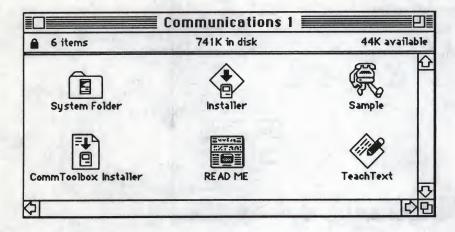
The instructions in this section explain how to use the Customize option in the Installer program to install the CTB and a specified communications tool or a group of tools. You may want to customize your installation when you already know that you will only be using a subset of the tools included with your SampleComm application. You should also use the Customize option when you want to install the CTB and a subset of tools onto a floppy disk or when you want to install tools on more than one disk.

Note: If you are installing the CTB and communications tools onto floppy disk(s), prepare your target disk(s) in advance. The first target disk should contain a System Folder with System version 6.0.2 or later.

When you are ready to begin, follow these steps:

- 1. If your Macintosh is on, save and quit from all applications and then choose Shut Down from the Special menu.
- 2. Insert the disk labeled *Communications 1* into a floppy disk drive and start your Macintosh.
- 3. Open the Communications 1 disk, by double-clicking on the disk icon that appears at the top right of your screen.

The disk opens and its contents is displayed.



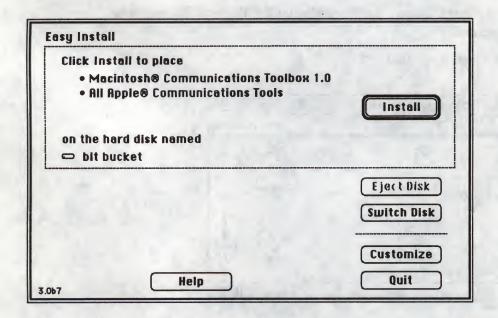
- 4. If you are installing the CTB and the tools onto floppy disk(s), insert a target disk that contains a System Folder (with System version 6.0.2 or later) in your other floppy drive.
- 5. Double click the Installer icon to start the Installer program.

In a few moments, the Installer's opening display appears.



#### 6. Click OK to display the Easy Install dialog box.

The figure below is a sample of this box.



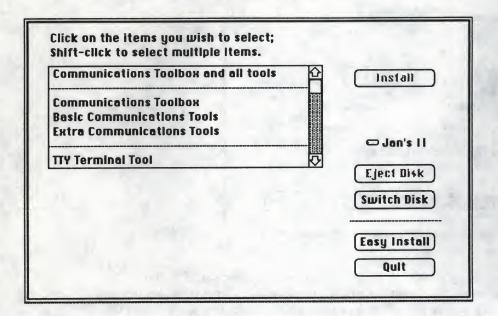
7. Make sure the disk indicated is the one onto which you want to install the CTB and tools. If not, click Switch Disk until the correct disk name appears.

#### △ Important

You can't install the CTB or the communications tools on the disk containing the Installer, on the disk you started up and are currently using, or on an AppleShare volume (file server).  $\triangle$ 

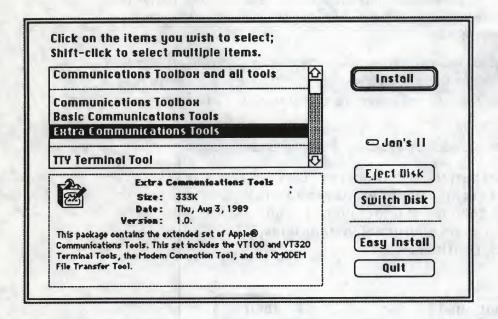
#### 8. Click Customize.

The Customization dialog box (shown below) appears.



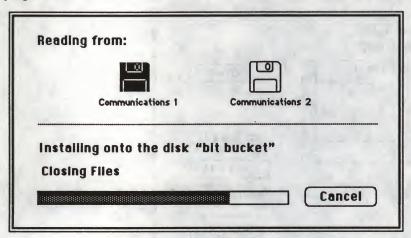
#### 9. Select the item(s) that you want to install.

As you select an item, an information box, similar to the one shown below, appears telling you about the item. To select more than one item, hold down the Shift key as you click each item.



#### 10. Click Install.

The Installer displays a status box (shown below) that keeps you informed as the installation progresses.

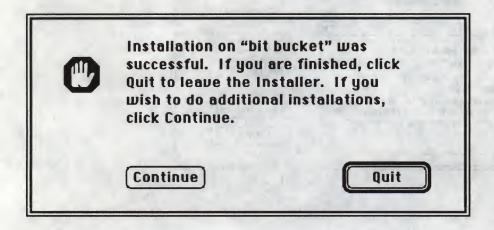


During the first few moments, you may halt the installation by clicking the Cancel button. However, once the Installer begins to delete old files, the Cancel button changes to a Stop button. As the installation continues, if some of the tools being installed are on the Communications 2 disk, the Installer prompts you to insert the Communications 2 disk and then to reinsert the Communications 1 disk. If you click the Stop button to halt the installation, the Installer stops after installing the files from the current Communications disk.

#### ▲ Warning

When you use the Stop button to interrupt installation, some tools that were available before you began the installation may no longer be available (since the Installer begins by deleting all of the old files and then starts installing the new ones).

When the installation process is complete, the Installer displays a message similar to the one shown below. If you open your System Folder, you will now find the CTB application icon and a folder labeled *Communications Folder* that contains the communications tools you have just installed.



- 11. If you want to install items onto a different disk, choose Continue and repeat the above steps using the Switch Disk button to change disks.
- 12. When you are through installing items, Choose Quit.
- 13. Choose Restart from the Special menu to eject the Communications 1 disk and to reboot your Macintosh.

The CTB and the communications tools you installed are ready to use with SampleComm.

# Installing additional communications tools

As new tools become available that can be used with SampleComm, you may want to take advantage of them. Usually, installing the new tools will be a matter of simply dragging the new tool into the Communications Folder in your System Folder. However, sometimes additional steps may be involved when installing new tools. The documents that accompany these new tools should include any special installation instructions.

# Part I Terminal Emulation Tools

This part of your guide describes the terminal emulation tools that accompanied your SampleComm application. A terminal emulator is software that allows one type of computer to imitate another type of computer terminal. The terminal emulation tools included with your SampleComm application makes it possible for your Macintosh computer to take on the communication characteristics of the following terminals:

Teletype (TTY) basic fixed-function terminals

VT102 standard Digital Equipment Corporation (DEC) text-only

terminals

VT320 DEC text-only terminals that offer a wide variety of

functionality, including support for international character

sets

The modules for each of the terminal emulation tools provide the following information:

- an overview of the tool
- descriptions of the configuration options used to set up your Macintosh as the emulator
- information about keys emulation
- trouble-shooting hints

In addition, the modules include any special considerations related to the particular terminal emulation.

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# **Teletype Terminal Emulation Tool**

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```

The Teletype (TTY) is a basic, line-oriented terminal. It supports typing, receipt of an incoming data stream, and on screen data display. TTY emulation can be used to access timesharing or information services that do not require a specific terminal.

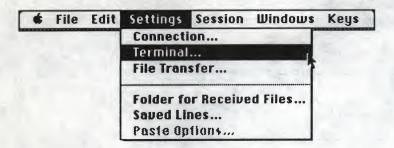
In order to provide additional functionality, the TTY tool offers a few extensions to the minimal features of a typical TTY. The following is a list of the functionality provided with the TTY tool:

- 80-character or 132-character screen widths
- 24-row screen length
- automatic repeat of noncontrol characters
- automatic repeat of control characters
- local echo mode
- automatic wrap mode
- smooth scroll mode
- transparent controls (controls appear as special characters)
- new line mode
- backspace and delete character swapping

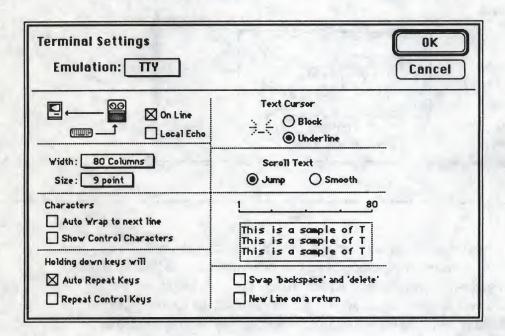
While your Macintosh is emulating a TTY, you can create a historical log by choosing Save Lines Off Top from the Session menu.

# TTY terminal settings

You choose the Terminal command from the Settings menu (shown below) to access a dialog box that lets you set the terminal emulation attributes for your Macintosh.

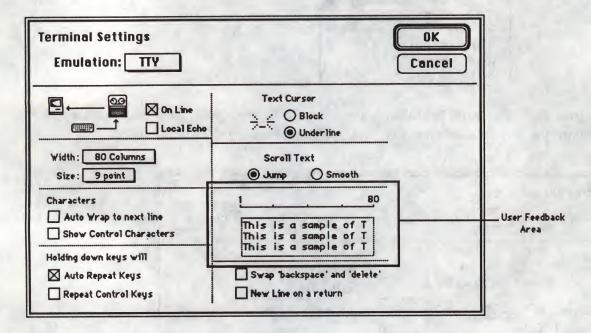


When you choose TTY from the Emulation pop-up menu in the Terminal Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to emulate a TTY (see below).



### User-feedback area

The Terminal Settings screen includes a user-feedback area that provides you with information about the settings you have chosen. When you change the settings for the Width, Size, Auto Wrap to Next Line, or Scroll Text options, you will notice corresponding changes in the user-feedback area. The sample screen below shows you how the user-feedback area looks when you are using the default settings for these options. Refer to the explanation of the individual options for information on how the user-feedback area changes when you change specific options.



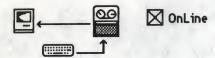
# Setup options

For each setup option, the most commonly used setting is preset as the default. However, you may need to change the settings for some options depending on the type of information being transmitted or on the communications requirements of the remote computer. In these cases, you should refer to documentation on the remote computer or contact your system's administrator for information on how the various options should be set for the communications environment that you are establishing.

The following subsections describe the setup options that are available in the TTY setup dialog box. The options are presented in order as they appear in the dialog box (moving from top to bottom and from left to right).

## On Line

The settings for this option determine whether or not your Macintosh is in communication mode, that is, is on line, with the remote computer to which it is has established a connection.



Your Macintosh is on line; that is, it is connected to and accessible to the remote computer. The characters that you type are sent to the remote computer and incoming data is displayed on your Macintosh screen. When you start a communications session, your Macintosh is on line.

When your Macintosh is on line, you may need to check the Local Echo option in order to cause characters to be sent to your Macintosh screen as they are sent to the remote computer. (However, if the remote computer specifies full duplex in its communications parameter, it automatically echoes back the characters you send, so you won't need to check Local Echo because the characters you type will already be displayed on your screen.) The Local Echo option is only available when the On Line option is checked.



Your Macintosh stops communicating with the remote computer without terminating the connection (a condition called "off line"). This state allows you to perform local editing, while maintaining the connection established with the remote computer.

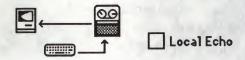
Checking the On Line option resumes communication with the remote computer.

When you are working off line, the characters that you type are automatically displayed on the Macintosh screen. Therefore, the Local Echo option is dimmed and unavailable when the On Line option is unchecked.

The default setting for On Line is checked.

## Local Echo

This option is available only when the On Line option is checked. The settings for the Local Echo option determine whether or not characters that you type on the keyboard or on the numeric keypad (or select from the Keypad menu) are sent to your Macintosh screen (as well as to the remote computer with which your Macintosh is communicating).



As you enter characters, they are sent only to the remote computer, not to your Macintosh screen.

However, if you are sending or receiving in full duplex, all the characters that you enter are echoed back by the remote computer. So, the Local Echo option should be unchecked when the remote computer specifies full duplex in its communications parameters (that is, when it echoes back your keystrokes).



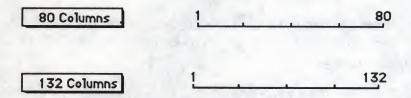
As you enter characters, they are sent to your Macintosh screen, as well as to the remote computer; all the characters that you enter are displayed on the Macintosh screen as you type them in.

You should check Local Echo when the remote computer specifies half duplex in its communications parameters (that is, when the remote computer does not echo back your keystrokes).

The default setting for Local Echo is unchecked.

#### Width

This pop-up menu lets you set the horizontal width of the screen that displays during TTY emulation. Two widths are supported: 80 characters per line and 132 characters per line. When you change the setting for the Width option, the scale in the user-feedback area of the dialog box changes accordingly.

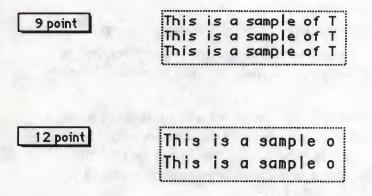


The default width is 80 characters per line.

◆ *Note*: When the Width option is changed, the terminal display area in your session document is cleared and the cursor is returned to the top left of the screen.

### Size

This pop-up menu lets you set the font size of the characters that display on the screen during TTY emulation. Two sizes are supported: 9 point and 12 point. When you change the setting for the Size option, the sample in the user-feedback area of the dialog box changes accordingly.



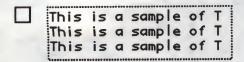
The default size is 9 point.

### Characters

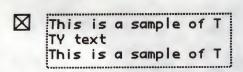
The two options in this group let you specify certain attributes of how characters are handled while your Macintosh is emulating a TTY terminal.

### Auto Wrap to next line

The settings for this option determine whether characters that would extend beyond the right margin wrap to the beginning of the next line. When you change the settings for this option, the sample in the user-feedback area of the dialog box changes accordingly.



When the cursor reaches the 80th or 132nd column, depending on the line length specified with the Width option, the cursor stops, and incoming characters write over the last character on the line until a new line character occurs in the incoming data stream.



When the cursor reaches the 80th or 132nd column, the TTY tool automatically moves the cursor to the first column of the next line. Uncheck this option if the remote computer already provides this feature.

The default setting for this option is unchecked.

### **Show Control Characters**

The settings for this option determine whether control characters display as readable characters.

- Control characters are not displayed as readable characters on the screen, but instead have their normal effect. For example, when a line feed is encountered, the cursor moves to the following line.
- Control characters display on the screen as they are encountered in the incoming data stream (and, when the Local Echo option is checked, as they are entered from the keyboard). Since displaying control characters may extend the line length, you may want to check the Auto Wrap to Next Line option so that the control characters can be inserted without causing characters to overwrite each other at the right-most column.

The default setting for this option is unchecked.

# Holding Down Keys will

The two options under this heading control key repetition.

## Auto Repeat Keys

The settings for this option determine whether the tab, return, and backspace characters, as well as all noncontrol characters, repeat when the corresponding keys are held down.

A character repeats when you hold down the corresponding key on the keyboard.

A character doesn't repeat when you hold down the corresponding key on the keyboard.

You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

The default setting for Auto Repeat Keys is checked.

♦ Note: To cause characters generated with Control key combinations (for example, the bell character and the line feed character) to repeat, the Repeat Control Keys option must be checked.

# Repeat Control Keys

The settings for this option determine whether control characters repeat when the corresponding key combinations are held down. Control characters are characters generated by pressing particular keys while holding down the Command key or the Control key (for example: a bell character is generated by holding the Command or Control key and pressing G; a line feed by Control-J or Command-J).

You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

A control character doesn't repeat when you hold down the corresponding key(s) on the keyboard.

A control character repeats when you hold down the corresponding key(s) on the keyboard.

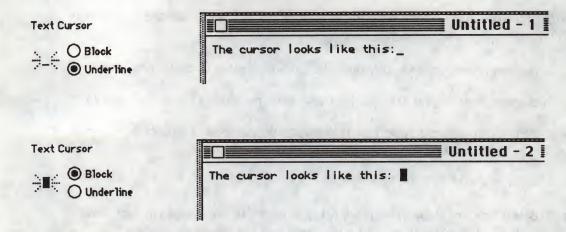
You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

The default setting for Repeat Control Keys is unchecked.

◆ Note: To cause tab, backspace, and return characters to repeat, the Auto Repeat Keys option must be checked.

### **Text Cursor**

The settings for this option determine whether the cursor is either a solid block or an underline, depending on which radio button is chosen.



The underline is the default setting for the Text Cursor option.

### Scroll Text

The settings for this option determine whether character-stream induced scrolling takes place smoothly. Smooth scrolling slows down the rate at which the incoming data is received, but makes it easier to read rapidly scrolling lines. When you change these settings, the sample text in the user-feedback area scrolls accordingly in order to demonstrate the effects of the change you are making.

Jump

Incoming data scrolls at the same rate as it is received. When you change this setting, the text in the user-feedback area is cleared and then reappears on the screen, demonstrating the way that incoming text will be displayed.

O Smooth

Character-stream induced scrolling takes place smoothly. When you change this setting, the text in the user-feedback area scrolls smoothly out of the area, demonstrating the way that incoming text will be displayed.

The default setting for Scroll Text is Jump.

# Swap 'backspace' and 'delete'

The settings for this option determine which character is sent when either the Backspace key (on the Classic keyboards) or the Delete key (on the ADB keyboards) is pressed.

## On ADB keyboards:

- When the Delete key is pressed, a backspace character (ASCII 08) is sent.
- When the Delete key is pressed while holding down the Control key, a delete character (ASCII 127) is sent.

# On Classic keyboards:

- When the Backspace key is pressed, a backspace character (ASCII 08) is sent.
- When the Backspace key is pressed while holding down the Command key, a delete character (ASCII 127) is sent.

# On ADB keyboards:

- When the Delete key is pressed, a delete character (ASCII 127) is sent.
- When the Delete key is pressed while holding down the Control key, a backspace character (ASCII 08) is sent.

### On Classic keyboards:

- When the Backspace key is pressed, a delete character (ASCII 127) is sent.
- When the Backspace key is pressed while holding down the Command key, a backspace character (ASCII 08) is sent.

The default setting for this option is unchecked.

#### New Line on a return

The settings for this option determine whether line feed characters in incoming files are interpreted as carriage return/line feed pairs. In addition, this option determines what character(s) are sent when you press the Return key.

A line feed is interpreted as only a line feed (not as a carriage return/line feed pair). When a line feed character is received from the remote computer, the cursor moves down one line, but stays in the same column, rather than moving to the beginning of the line.

When you press the Return key, just a carriage return character is sent, which moves the cursor to the first position on the same line.

A line feed is interpreted as a carriage return/line feed pair. When a line feed character is received from the remote computer, the cursor moves to the first position on the next line. Use this

option when incoming data does not move down to the beginning of the next line.

When you press the Return key, both a return and a line feed character are sent, which moves the cursor to the first position on the next line.

The default setting for this option is unchecked.

# TTY keys emulation

There is no Keys menu for TTY emulation.

With the TTY tool, Classic keyboards are affected as follows:

- the Command key functions as a Control key
- the Tilde/Accent Grave (~/`) key generates an escape character
- the Command-Tilde/Accent Grave key combination generates a tilde (~)
- the Command-Shift-Tilde/Accent Grave key combination generates an accent grave (`)

However, on ADB keyboards

- a Control key is available for creating control characters, so the Command key can be used to create Command-Key equivalents
- an Escape key is available for generating an escape character, so the Tilde/Accent Grave key generates a tilde (~) and the Command-Tilde/Accent Grave key combination generates an accent grave (`).

However, since the TTY tool does not perform any other special keyboard remapping, cursor keys and function keys are not available; the numeric keypad simply generates numbers and numeric operators.

# Special characters

form feed

Since a TTY is a basic terminal, it does not support any special editing functions (such as, inserting or deleting lines) or character display functions (such as, bolding and underlining). However, a TTY responds to the following ASCII special characters, which are also recognized by the TTY tool:

backspace moves the cursor back one character

bell sounds a bell

carriage return moves the cursor to the start of the line delete moves the cursor back one character

horizontal tab moves the cursor to the next tab location

clears the screen

line feed, vertical tab moves the cursor to the next line

# Trouble-shooting hints

Most problems that you encounter while using the TTY terminal emulation tool are caused by mismatched communications parameters—the settings that you have chosen are not compatible with the settings for the computer with which you are communicating. If data is not being sent and received correctly, compare the settings for the communications attributes; keep in mind that the problems could also be caused by mismatched settings for the connection tool or the file transfer tool being used for the session.

Make sure that the settings for the TTY tool setup options match the requirements of the remote computer. Here are some suggestions for how to correct some of the problems you could encounter when the setup options are not set correctly:

### If nothing gets sent or received

Make sure that the On Line option is checked. When you are unable to send or receive data, you may also need to check the physical connections and/or the setup options for the connection tool being used for the session.

- If nothing appears on the screen when you send or receive data Check the Local Echo option.
- If the data appears as double characters

Uncheck the Local Echo option.

■ If incoming data writes over the last character on the first line

Check the Auto Wrap to Next Line option and the New Line on a Return option.

If lines of incoming data are double-spaced

Uncheck the New Line on a Return option.

■ If incoming data writes over the same line

Check the New Line on a Return option.

■ If incoming characters disappear off the edge of the screen

Check the Auto Wrap to Next Line option.

If the cursor is not visible on the screen

The cursor may have been scrolled out of the visible screen, click on the active scroll bar to scroll the cursor back into the visible screen.

# VT102 Terminal Emulation Tool

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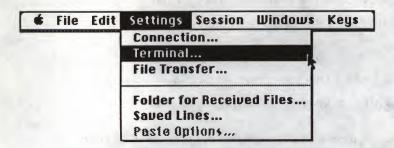
The DEC VT102 family of terminals is an industry standard group of video terminals used as input and output devices for remote computers. The VT102 terminal emulation tool allows you to set general, screen, keyboard, and character set attributes for your Macintosh so that it can perform like a VT102 terminal. The VT102 tool follows the ANSI VT100 model very closely, with the following exceptions:

- The default screen on the Macintosh is dark text on a light background. (On the DEC VT102, the default is light text on a dark background.)
- With the VT102 tool, there is no relationship between the Cursor Key mode and the Keypad mode. (On the DEC VT102, the Cursor Key mode can only be set if the Keypad Mode is set to Application.)
- The VT102 tool expands the standard VT102 character set options to include several international character sets.
- The VT102 tool ignores printing sequences that would control a printer that is locally attached to the DEC VT102.
- The VT102 tool ignores testing sequences specific to the DEC VT102.
- The VT102 tool allows you to swap the functions of the Backspace and Delete keys.

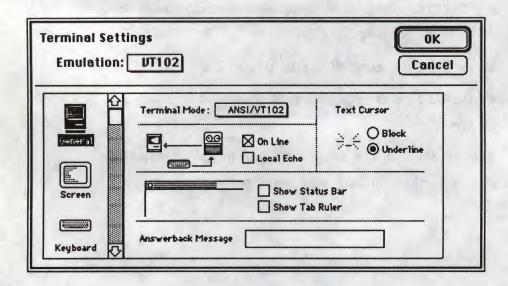
While your Macintosh is emulating a VT102, you can create a historical log by choosing Save Lines Off Top from the Session menu.

# VT102 terminal settings

You choose the Terminal command from the Settings menu (shown below) to access a dialog box that lets you set the terminal emulation attributes for your Macintosh.



To set the attributes for VT102 emulation, you choose VT102 from the Emulation pop-up menu in the Terminal Settings dialog box. A list of setup icons and a group of setup options display. The setup options that display within the dialog box vary depending on which of the four setup icons (General, Screen, Keyboard, or Character Set) is selected. When you first select VT102 from the pop-up menu, the General icon is selected and the options that fall into the General category are displayed, as shown below.



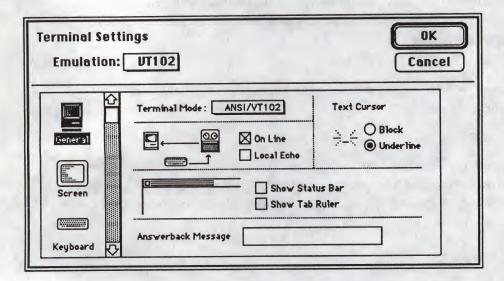
For each option, the most commonly used setting is preset as the default. However, you may need to change the setting for some options depending on the type of connection you are using, on the type of information being transmitted, or on the communications requirements of the remote computer. In these cases, you should refer to documentation for the remote computer or contact your system's administrator for information on how the various options should be set for the communications environment that you are establishing.

 Note: During a communications session, you may notice that some settings may change based on communications from the host.

The following sections describe the setup options available with each of the four VI'102 setup icons (General, Screen, Keyboard, and Character Set). Within each of these four sections, the individual options are described in order as they appear in the dialog box (moving from top to bottom and from left to right).

# General setup options

When you select the General icon in the VT102 setup dialog box, the setup options shown below are displayed.



# **Terminal Mode**

You use this pop-up menu to specify which VT102 mode your Macintosh should be in:

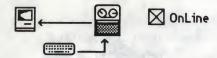
ANSI/VT102 The typical mode for VT102 emulation.

VT52 The mode used to emulate a DEC VT52 terminal. When this mode is chosen, the Character Set setup screen is disabled.

The default setting for the terminal mode option is ANSI/VT102.

### On Line

The settings for this option determine whether or not your Macintosh is in communication mode, that is, is on line, with the remote computer to which it is has established a connection.



Your Macintosh is on line; that is, it is connected to and accessible to the remote computer. The characters that you type are sent to the remote computer and incoming data is displayed on the screen. When you start a communications session, your Macintosh is on line.

When your Macintosh is on line, you may need to check the Local Echo option in order to cause characters to be sent to your Macintosh screen as they are sent to the remote computer. (However, if the remote computer specifies full duplex in its communications parameter, it automatically echoes back the characters you send, so you won't need to check Local Echo because the characters you type will already be displayed on your screen.) The Local Echo option is only available when the On Line option is checked.



Your Macintosh stops communicating with the remote computer without terminating the connection (a condition called "off line"). This state allows you to perform local editing, while maintaining the connection established with the remote computer.

Checking the On Line option resumes communication with the remote computer.

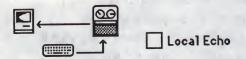
When you are working off line, the characters that you type are automatically displayed on the Macintosh screen. Therefore, the Local Echo option is dimmed and unavailable when the On Line option is unchecked.

The default setting for On Line is checked.

◆ Note: If the Show Status Bar option is selected, you can look at the "On Line" indicator that appears on the status bar at the top of your screen to determine whether or not the On Line option is checked.

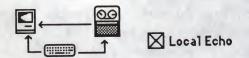
### Local Echo

This option is available only when the On Line option is checked. The settings for the Local Echo option determine whether or not characters that you type on the keyboard or on the numeric keypad (or select from the Keypad menu) are sent to your Macintosh screen (as well as to the remote computer with which your Macintosh is communicating).



As you enter characters, they are sent only to the remote computer, not to your Macintosh screen.

However, if you are sending or receiving in full duplex, all the characters that you enter are echoed back by the remote computer. So, the Local Echo option should be unchecked when the remote computer specifies full duplex in its communications parameters (that is, when it echoes back your keystrokes).



As you enter characters, they are sent to your Macintosh screen, as well as to the remote computer; all the characters that you enter are displayed on the Macintosh screen as you type them in.

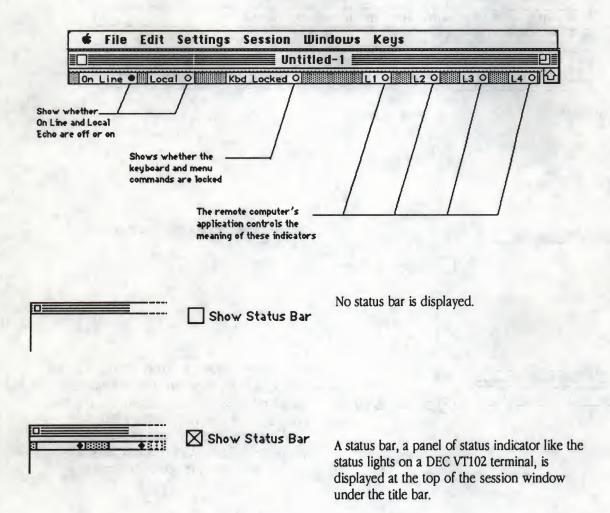
You should check Local Echo when the remote computer specifies half duplex in its communications parameters (that is, when the remote computer does not echo back your keystrokes).

The default setting for Local Echo is unchecked.

♦ Note: If the Show Status Bar option is selected, you can look at the "Local" indicator that appears on the status bar at the top of your screen to determine whether or not the Local Echo option is checked.

## Show Status Bar

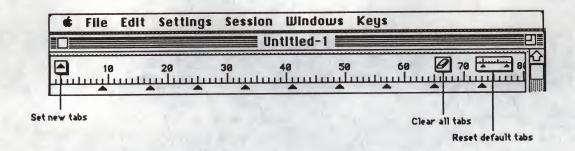
The settings for this option determine whether a status bar (similar to the status lights on a DEC VT102 terminal) appears at the top of the VT102 terminal emulation screen (above any tab ruler). An example of the status bar is shown below; if the light next to a label is on, the option is currently selected.

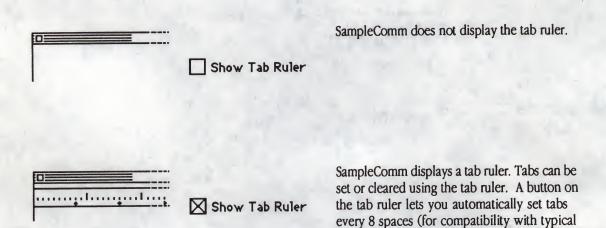


The default setting for Show Status Bar is unchecked.

## Show Tab Ruler

The settings for this option determine whether a tab ruler displays at the top of the VT102 terminal screen. (The tab ruler displays below any status bar.)





The default setting for Show Tab Ruler is unchecked.

VT102 terminal screens). Another button lets you to clear all tabs. A third button lets you automatically reset the default tab settings.

### Answerback

This option lets you enter the character string that is returned to the remote computer when an answerback character is detected in the incoming data stream. The answerback string provides an identification response to the remote computer. The remote computer specifies what this answerback string must be. You may need to send an answerback message when you're communicating with certain types of private computer systems. Most public information services don't require an answerback string.

The answerback string can contain from 0 to 20 characters. Some answerback messages require a control character—for example, the control character ^M designates a return character. You type the control character by using the Shift key to type the caret (^) above the number 6 key on the main keyboard and then typing the appropriate letter. Control characters are included in the 0-20 character count.

<Reviewers: It is still being determined whether the previous statement will be true in this tool.>>

In addition to using the answerback string as a required response to a host computer, you can use it when you're communicating with another Macintosh or other personal computer. The answerback string is a convenient way to let the other computer know that you've made contact.

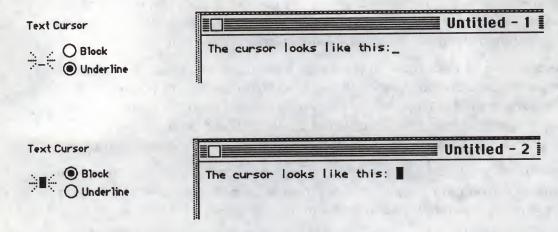
When communicating with a large computer system, SampleComm sends the answerback string that you've specified when the other computer requests it. Or, you can manually control transmission of the answerback string, using the following methods:

- Control-Enter sends the answerback string: Hold down the Control or Command key and press Enter. SampleComm sends the answerback string.
- Control-E asks for the answerback string: Hold down the Control or Command key and press E. The computer at the other end automatically sends its answerback message.

<< Reviewers: Can you help me devise a sample answerback string?>>

## **Text Cursor**

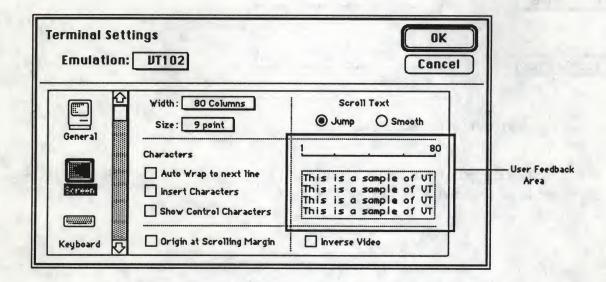
The settings for this option determine whether the cursor is either a solid block or an underline, depending on which radio button is chosen.



The underline is the default setting for the Text Cursor option.

# Screen setup options

When you select the Screen icon in the VT102 setup dialog box, the setup options shown below are displayed.

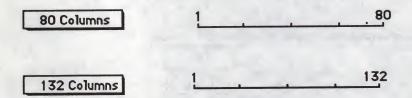


### User-feedback area

The user-feedback area provides you with information about the settings you have chosen. When you change the settings in the Width, Size, Auto Wrap to Next Line, Scroll Text, or Inverse Video options, you will notice corresponding changes in the user-feedback area. Refer to the explanation of the individual options for information on how the area changes when you change the settings for specific options.

### Width

This pop-up menu lets you set the horizontal width of the screen that displays during VT102 emulation. Two widths are supported: 80 characters per line and 132 characters per line. When you change the setting for the Width option, the scale in the user-feedback area of the dialog box changes accordingly.

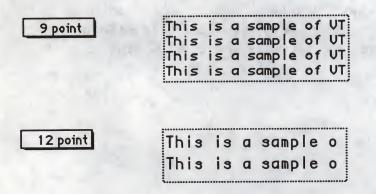


The default width is 80 characters per line.

♦ *Note*: When the Width option is changed, the terminal display area in your session document is cleared and the cursor is returned to the top left of the screen.

### Size

This pop-up menu lets you set the font size of the characters that display on the screen during VT102 emulation. Two sizes are supported: 9 point and 12 point. When you change the setting for the Size option, the sample in the user-feedback area of the dialog box changes accordingly.



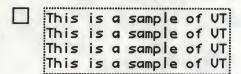
The default size is 9 point.

### Characters

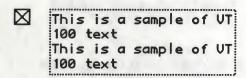
The three options in this group let you specify certain attributes of how character are handled while your Macintosh is emulating a VT102 terminal.

### Auto Wrap to next line

The settings for this option determine whether characters that would extend beyond the right margin wrap to the beginning of the next line. When you change the settings for this option, the sample in the user-feedback area of the dialog box changes accordingly.



When the cursor reaches the 80th or 132nd column, depending on the line length specified with the Width option, the cursor stops, and incoming characters write over the last character on the line until a new line character occurs in the incoming data stream.



When the cursor reaches the 80th or 132nd column, the VT102 tool automatically moves the cursor to the first column of the next line. Uncheck this option if the remote computer already provides this feature.

The default setting for this option is unchecked.

#### Insert Mode

The settings for this option determine whether characters are inserted between existing text or whether they write over existing text.

- Characters are inserted to the right of the cursor—characters continue moving to the right as new characters are inserted (characters moving past the right margin are lost). << What if Auto Wrap is on?>>
- Characters are written over the existing characters.

The default setting for Insert Mode is unchecked.

### Show Control Characters

The settings for this option determine whether control characters display as readable characters.

- Control characters are not displayed as readable characters on the screen, but instead have their normal effect. For example, when a line feed is encountered, the cursor moves to the following line.
- Control characters display on the screen as they are encountered in the incoming data stream (and, when the Local Echo option is checked, as they are entered from the keyboard). Since displaying control characters may extend the line length, you may want to check the Auto Wrap to Next Line option so that the control characters can be inserted without causing characters to overwrite each other at the right-most column.

The default setting for this option is unchecked.

# Origin at Scrolling Margin

The settings for this option determine whether or not the cursor can move outside of the scrolling region (the area between the top and bottom margins). In addition, this option determines whether or not screen addressing is in absolute or relative coordinates.

- The cursor can be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on absolute coordinates, where line 1, column 1, is in the upper left corner of the screen, rather than within the scrolling region.
- The cursor cannot be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on relative coordinates, where line 1, column 1, is in the upper left corner of the scrolling region.

The default setting for this option is unchecked.

## Scroll Text

The settings for this option determine whether character-stream induced scrolling takes place smoothly. Smooth scrolling slows down the rate at which the incoming data is received, but makes it easier to read rapidly scrolling lines. When you change these settings, the sample text in the user-feedback area scrolls accordingly in order to demonstrate the effects of the change you are making.

Incoming data scrolls at the same rate as it is received. When you change this setting, the text in the user-feedback area is cleared and then reappears on the screen, demonstrating the way that incoming text will be displayed.

Character-stream induced scrolling takes place smoothly. When you change this setting, the text in the user-feedback area scrolls smoothly out of the area, demonstrating the way that incoming text will be displayed.

The default setting for Scroll Text is Jump.

### Inverse Video

The settings for this option determine whether or not the Macintosh displays light text on a dark background or dark text on a light background. Normally, the Macintosh displays dark text on a light background. When you activate inverse video, light text appears on a dark background. When you change the setting for this option, the background and text in the user-feedback area of the dialog box change accordingly.

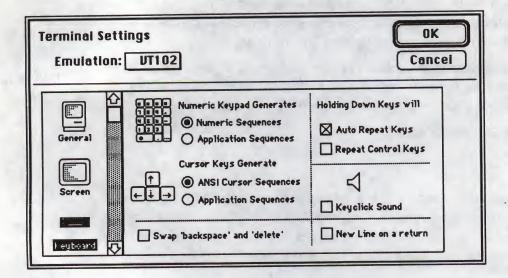




The default setting for Inverse Video is unchecked.

# Keyboard setup options

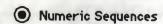
When you select the Keyboard icon in the VT102 setup dialog box, the setup options shown below are displayed.



## Numeric Keypad Generates

The settings for this option determine whether the keys on the keypad generate numeric characters or control characters, depending on which radio button is selected.





The keys on the keypad generate characters that match the typical numeric, comma, period, and minus sign keys on the VT102-type keyboard (in accordance with ANSI specifications).



Application Sequences

The keys on the keypad generate special control functions (based on Digital Equipment Corporation specifications).

The default setting for this option is Numeric Sequences.

## **Cursor Keys Generate**

This settings for this option determine the characters transmitted when the Cursor (Arrow) keys are pressed.



When Cursor keys are pressed, ANSI cursorcontrol sequences are transmitted to the remote computer (see the table below).



When Cursor keys are pressed, cursor-control functions (specified by Digital Equipment Corporation) are transmitted to the remote computer (as shown in the table below).

The default setting for this option is ANSI Cursor Sequences.

#### Cursor Key Sequences

Cursor Key	AN	SI Seque	ences	Applic	ation Se	quences	
Up Arrow	ESC	[	A	ESC	0	A	
	27†	91	65	27	79	65	
Down Arrow	ESC	[	В	ESC	0	В	
	27	91	66	27	79	66	
Left Arrow	ESC	[ -	С	ESC	0	С	
	27	91	67	27	79	67	
Down Arrow	ESC	[	D	ESC	0	D	
	27	91	68	27	79	68	
DOWN ANOW	27	91 mal value	68		79	_	

## Swap 'backspace' and 'delete'

The settings for this option determine which character is sent when either the Backspace key (on the Classic keyboards) or the Delete key (on the ADB keyboards) is pressed.

On ADB keyboards:

- When the Delete key is pressed, a backspace character (ASCII 08) is sent.
- When the Delete key is pressed while holding down the Control key, a delete character (ASCII 127) is sent.

On Classic keyboards:

- When the Backspace key is pressed, a backspace character (ASCII 08) is sent.
- When the Backspace key is pressed while holding down the Command key, a delete character (ASCII 127) is sent.

On ADB keyboards:

- When the Delete key is pressed, a delete character (ASCII 127) is sent.
- When the Delete key is pressed while holding down the Control key, a backspace character (ASCII 08) is sent.

On Classic keyboards:

- When the Backspace key is pressed, a delete character (ASCII 127) is sent.
- When the Backspace key is pressed while holding down the Command key, a backspace character (ASCII 08) is sent.

The default setting for this option is unchecked.

## Holding Down Keys will

The two options under this heading control key repetition.

### Auto Repeat Keys

The settings for this option determine whether the tab, return, and backspace characters, as well as all noncontrol characters, repeat when the corresponding keys are held down.

A character repeats when you hold down the corresponding key on the keyboard.

A character doesn't repeat when you hold down the corresponding key on the keyboard.

You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

The default setting for Auto Repeat Keys is checked.

♦ Note: To cause characters generated with Control key combinations (for example, the bell character and the line feed character) to repeat, the Repeat Control Keys option must be checked.

## Repeat Control Keys

The settings for this option determine whether control characters repeat when the corresponding key combinations are held down. Control characters are characters generated by pressing particular keys while holding down the Command key or the Control key (for example: a bell character is generated by holding the Command or Control key and pressing G; a line feed by Control-J or Command-J).

A control character doesn't repeat when you hold down the corresponding key(s) on the keyboard.

A control character repeats when you hold down the corresponding key(s) on the keyboard.

You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

The default setting for Repeat Control Keys is unchecked.

◆ Note: To cause tab, backspace, and return characters to repeat, the Auto Repeat Keys option must be checked.

## Keyclick

The settings for this option determine whether or not an electronic sound (for example, a "beep") is made when a key is pressed. The Keyclick option has the following effects:

J

Clicks are not sounded when keys are pressed.

Keyclick Sound



A click is sounded each time you press a key. (If the keyboard is locked, there will be no keyclick sound, even if this option is checked.)

Keyclick Sound

The default setting for Keyclick is unchecked.

#### New Line on a return

The settings for this option determine whether line feed characters in incoming files are interpreted as carriage return/line feed pairs. In addition, this option determines what character(s) are sent when you press the Return key.

A line feed is interpreted as only a line feed (not as a carriage return/line feed pair). When a line feed character is received from the remote computer, the cursor moves down one line, but stays in the same column, rather than moving to the beginning of the line.

When you press the Return key, just a carriage return character is sent, which moves the cursor to the first position on the same line.

A line feed is interpreted as a carriage return/line feed pair. When a line feed character is received from the remote computer, the cursor moves to the first position on the next line. Use this option when incoming data does not move down to the beginning of the next line.

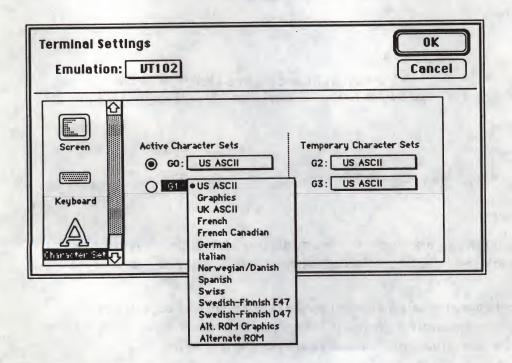
When you press the Return key, both a return and a line feed character are sent, which moves the cursor to the first position on the next line.

The default setting for this option is unchecked.

## Character Set setup options

When you select the Character Set icon in the VT102 setup dialog box, you have access to pop-up menus that allow you to specify the character sets for display on your Macintosh screen.

◆ Note: If you have selected VT52 mode, this screen is dimmed and cannot be configured.



A character set is a collection of characters that can be shown on a screen or used to code computer instructions. The VT102 tool supports fourteen different character sets (each of which contain a maximum of 127 characters). Usually, you will only use the character set appropriate for your country and language; however, you might need the Graphics character set to do on-screen graphics, or a German character set, for example, to communicate with a multilingual mainframe.

♦ Note: The typical VT102 supports character sets with 7-bit characters. Since most of the optional characters on the Macintosh keyboard (those generated by key combinations that include the Option key) are 8-bit characters, they are not available while you are using the VT102 tool.

The G0 and G1 menus are used to specify the active character set, the one currently being used to display character on the screen. At any given time, only one character set may be active. The G2 and G3 menus let you specify temporary character sets—the VT102 tool can switch to a temporary character set in order to generate one character and then switch back to the last active character set (either G0 or G1).

All four pop-up menus (G0, G1, G2, and G3) contain identical lists of the characters sets supported by the VT102 tool. The following is a summary of the character sets available on these menus:

US ASCII The standard set of letters, numbers, and symbols used in North American English

computers. This is the default character set on all of the menus.

Graphics The set of graphics characters used to create line drawings on a VT102 terminal.

International UK ASCII—the same as US ASCII but with the pound sterling symbol (£) instead of

the number sign (\*); Norwegian, French, Spanish, German, Danish, French-Canadian, Italian, Swedish-Finnish E47, and Swedish-Finnish D47—various character sets with accented characters. Note that the keyboard layouts for these character sets follow the DEC standard and may be different from the Macintosh keyboard layouts for

that country.

Alternate ROM Alternate ROM—character sets used in special versions

of the VT102 terminal.

◆ Note: See the DEC VT102 Programmer's Guide for additional details on these character sets.

When you are working off line or entering characters to be sent to a remote computer, you must set the character set options yourself (or use the preset defaults). However, when you are receiving data from a remote computer, although you can specify the character set to use for displaying data, the remote application may change your selection by

- changing the setting for which menu contains the active character set
- changing the character set selections on any of the menus

Usually, you won't notice these changes because most applications reset the setting to your original choices.

## **Active Character Sets**

You use these pop-up menus (G0 and G1) to specify the active character set and an alternate. Both menus contain the same list of 14 character sets, and US ASCII is the default for both menus. The G0 menu is the default for the active character set.

You can change the selection on either of these menus by pulling down the menu and clicking on a different character set; you can change the active character set by clicking on the other radio button.

## **Temporary Character Sets**

These menus (G2 and G3) specify the two temporary character sets. Both menus contain the same list of 14 character sets, and US ASCII is the default for both menus. You can change the selection on either of these menus by pulling down the menu and clicking on a different character set.

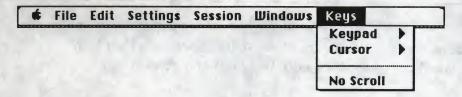
The character sets specified in the G2 or G3 menus can be swapped in for only one character at a time (that is, either G2 or G3 temporarily becomes the active character set, one character is generated, and then the VT102 tool switches back to either G0 or G1, which ever was the last active character set).

# VT102 keys emulation

There are some keys on VT102 keyboards that do not exist on the Macintosh keyboards; the VT102 tool has made provisions for the Macintosh to emulate these keys.

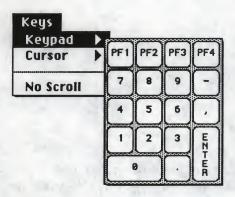
In some cases, the VT102 tool has mapped the VT102 keys to certain key combination on the Macintosh keyboards. In other cases, you can choose the key from a Keys menu that appears in the menu bar at the top of your Macintosh screen during VT102 emulation. Frequently, you can emulate the VT102 keys either from the Keys menu or with key combinations.

## The Keys menu

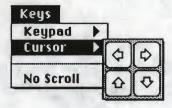


There are two submenus on the VT102 tool Keys menu:

the numeric keypad



the Cursor keys (Arrows)



When you select a key cell from the either the Keypad or the Cursor menu, it produces the same result as when you press the physical key on the keyboard.

The third item on the Keys menu, "No Scroll", is available only when the connection tool being used for the session is setup to use the XON/XOFF handshake protocol; otherwise, this item is dimmed and unavailable. The No Scroll item lets you toggle between sending an XOFF to halt scrolling and an XON to restart scrolling. (Equivalent control sequences are Control-Q for XOFF and Control-S for XON.) When the scrolling is halted, the No Scroll item on the menu is checked.

## Keyboard mapping

The following VT102 keys do not have equivalent keys on all Macintosh keyboards and so have been mapped to the Keys menu, to keyboard combinations on the Macintosh keyboards, or to both:

- Backspace/Delete
- Break
- Control
- Cursor keys
- Escape
- Keypad
- Line Feed
- No Scroll
- Setup

The subsections that follow explain how to emulate each of these VT102 keys with the VT102 tool. At the back this binder, you will find a quick-reference card for the VT102 key mappings. <<Not in this draft.>>

## Backspace/Delete keys

On the Classic keyboards, there is a Backspace key. On the Apple Desktop Bus<sup>TM</sup> (ADB) keyboards, there is a Delete key (which transmits a backspace character on its own and a delete character when pressed with a Control key).

On ADB keyboards, the mapping for VT102 emulation is handled as follows:

Delete

generates a backspace character

Control-Delete

generates a delete character

You may swap these functions by changing the setting for the Swap 'backspace' and 'delete' option on the Keyboard setup screen.

On Classic keyboards, the mapping for VT102 emulation is handled as follows:

Backspace generates a backspace character

Command-Backspace generates a delete character

Again, you may swap these functions by changing the setting for the Swap 'backspace' and 'delete' option on the Keyboard setup screen.

#### Break key

On the VT102 keyboard, the Break key performs the following three different functions:

Break generates a short break to interrupt the flow of data

Shift-Break generates a long break disconnect, which usually disconnects the terminal from the

communication line

Control-Break generates the answerback message

On any Macintosh keyboard, use the following:

Option-Enter to generate a short break
Shift-Enter to generate a long break

Command-Enter to generate an answerback message

The effect of a short break character is connection-protocol dependent. When the serial driver is being used, a <<short?>> break character causes the Data Terminal Ready (DTR) signal to be dropped. With ADSP, breaks have no effect.

#### Control key

On ADB keyboards, there is a Control key.

On Classic keyboards, the Command key serves as the Control key (this means, that you can't use the Command key on Classic keyboards for keyboard shortcuts).

## Cursor keys

Cursor keys (Arrows) exist on Classic Extended keyboards, on Classic Keypads, and on ADB keyboards. Since the Cursor keys do not exist on the older Classic keyboards, they are also emulated in the Keys menu.

## Escape key

On ADB keyboards, there is an Escape key.

On Classic keyboards, the upper right key, the tilde/accent grave (~/`) key is used for the Escape key. To generate a tilde (~) on the Classic keyboard, use Command-`; to generate an accent grave (`), use Command-Shift-`.

## Keypad keys

The VT102 keypad physically maps one-to-one to the Macintosh keypad on the Classic Extended keyboards, on Classic Keypads, and on ADB keyboards. In addition, since older Classic keyboards do not include a Keypad, the VT102 Keypad keys are emulated in the Keys menu.

## Line Feed key

On all Macintosh keyboards, a line feed is generated with the Option-Return key combination.

## No Scroll key

The VT102 No Scroll key is simulated in the Keys menu.

## Setup key

Instead of providing a keyboard equivalent to the VT102 Setup key, the VT102 tool lets you use the Settings dialogs for setup operations.

# Trouble-shooting hints

Most problems that you encounter while using the VT102 terminal emulation tool are caused by mismatched communications parameters—the settings that you have chosen are not compatible with the settings for the computer with which you are communicating. If data is not being sent and received correctly, compare the settings for the communications attributes; keep in mind that the problems could also be caused by mismatched settings for the connection tool or the file transfer tool being used for the session.

Make sure that the settings for the VT102 tool setup options match the requirements of the remote computer. Here are some suggestions for how to correct some of the problems you could encounter when the setup options are not set correctly:

## If nothing gets sent or received

Make sure that the On Line option is checked. When you are unable to send or receive data, you may also need to check the physical connections and/or the setup options for the connection tool being used for the session.

- If nothing appears on the screen when you send or receive data Check the Local Echo option.
- If the data appears as double characters Uncheck the Local Echo option.
- If characters that you enter do not appear on the screen and if your Macintosh beeps with each keystroke

The keyboard is locked. Unlock the keyboard by selecting the No Scroll item from the Keys menu or by pressing Control-Q. (If the No Scroll menu item is unavailable or if Control-Q does not work, make sure the the XON/XOFF handshake protocol is selected in the connection tool being used for the session.)

- If incoming data writes over the last character on the first line

  Check the Auto Wrap to Next Line option and the New Line on a Return option.
- If lines of incoming data are double-spaced
  Uncheck the New Line on a Return option.
- If incoming data writes over the same line
  Check the New Line on a Return option.

- If nothing appears on the screen when you send or receive data

  Check the Local Echo option.
- If the cursor is not visible on the screen

  The cursor may have been scrolled out of the visible screen, click on the active scroll bar to scroll the
- cursor back into the visible screen.
   If the terminal is displaying unexpected characters (for example, graphics characters or characters from a non-US ASCII character set)

Check the setting on the character set screen; make sure that the active character set is G0 and that US ASCII is designated as the G0 character set.

# VT320 Terminal Emulation Tool

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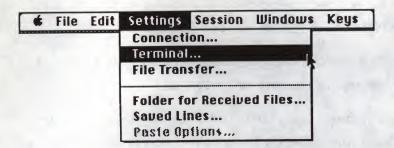
The VT320 is an enhanced DEC text-only terminal that accommodates international environments through support of 8-bit character sets. The VT320 terminal emulation tool lets you set general, screen, keyboard, and character set attributes for your Macintosh so that it can perform like a VT320 terminal. The VT320 tool follows the ANSI VT320 model very closely, with the following exceptions:

- The default screen on the Macintosh is dark text on a light background (On the DEC VT320, the default is light text on a dark background.)
- With the VT320 tool, there is no relationship between the Cursor Key mode and the Keypad mode. (On the DEC VT320, the Cursor Key mode can only be set if the Keypad Mode is set to Application.)
- The VT320 tool ignores printing sequences that would control a printer that is locally attached to the DEC VT320.
- The VT320 tool ignores escape sequences that are used by DEC VT320 terminals for testing, controlling local printing, and controlling screen alignment.
- The VT320 tool allows you to swap the functions of the Backspace and Delete keys.
- The VT320 tool limits down-loadable fonts to 9 or 12 points only.

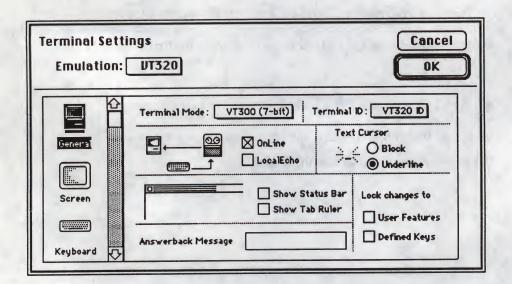
While your Macintosh is emulating a VT320, you can create a historical log by choosing Save Lines Off Top from the Session menu.

# VT320 terminal settings

You choose the Terminal command from the Settings menu (shown below) to access a dialog box that lets you set the terminal emulation attributes for your Macintosh.



To set the attributes for VT320 emulation, you choose VT320 from the Emulation pop-up menu in the Terminal Settings dialog box. A list of setup icons and a group of setup options display. The setup options that display within the dialog box vary depending on which of the four setup icons (General, Screen, Keyboard, or Character Set) is selected. When you first select VT320 from the pop-up menu, the General icon is selected and the options that fall into the General category are displayed, as shown below.



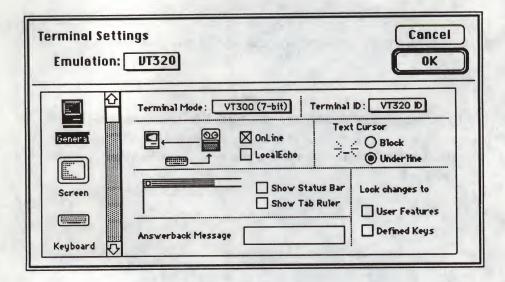
For each option, the most commonly used setting is preset as the default. However, you may need to change the settings for some options depending on the type of connection you are using, on the type of information being transmitted, or on the communications requirements of the remote computer. In these cases, you should refer to documentation for the remote computer or contact your system's administrator for information on how the various options should be set for the communications environment that you are establishing.

 Note: During a communications session, you may notice that some settings may change based on communications from the host.

The following sections describe the setup options available with each of the four VT320 setup icons (General, Screen, Keyboard, and Character Set). Within each of these four sections, the individual options are described in order as they appear in the dialog box (moving from top to bottom and from left to right).

# General setup options

When you select the General icon in the VT320 setup dialog box, the setup options shown below are displayed.



#### **Terminal Mode**

You use this pop-up menu to specify which VT320 mode your Macintosh should be in.

4.45		1-	
- V	<b>1300</b>	(7-	bit)

The terminal can use all of the VT320 features—supports 8-bit graphic display characters and 7-bit control characters. Use this setting for all VT200 applications. DEC recommends this mode for most applications.

## VT300 (8-bit)

The terminal uses all the VT320 features that are available in an 8-bit environment with 8-bit control characters. Use this settings for VT320 applications that support 8-bit control characters. Although this mode offers the most efficiently, it is not supported by some applications.

#### ANSI/VT100

The terminal can run applications that require strict VT100 compatibility.

VT52

The terminal can run applications designed for DEC VT52 terminals. When this mode is chosen, the Character Set setup screen is disabled.

The default setting for the terminal mode option is VT300 (7-bit).

#### Terminal ID

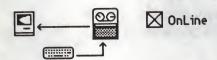
You use this pop-up menu to select the terminal ID. The terminal ID is a device attributes response that some application require. The terminal ID lets the host know specific operating attributes of the terminal. With the VT320 tool you may use any of the following terminal IDs:

- VT320ID
- VT100ID
- VT102ID
- VT103ID
- VT220ID

The default setting for the Terminal ID option is VT320ID.

#### On Line

The settings for this option determine whether or not your Macintosh is in communication mode, that is, is on line, with the remote computer to which it is has established a connection.



Your Macintosh is on line; that is, it is connected to and accessible to the remote computer. The characters that you type are sent to the remote computer and incoming data is displayed on the screen. When you start a communications session, your Macintosh is on line.

When your Macintosh is on line, you may need to check the Local Echo option in order to cause characters to be sent to your Macintosh screen as they are sent to the remote computer. (However, if the remote computer specifies full duplex in its communications parameter, it automatically echoes back the characters you send, so you won't need to check Local Echo because the characters you type will already be displayed on your screen.) The Local Echo option is only available when the On Line option is checked.



Your Macintosh stops communicating with the remote computer without terminating the connection (a condition called "off line"). This state allows you to perform local editing, while maintaining the connection established with the remote computer.

Checking the On Line option resumes communication with the remote computer.

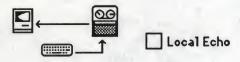
When you are working off line, the characters that you type are automatically displayed on the Macintosh screen. Therefore, the Local Echo option is dimmed and unavailable when the On Line option is unchecked.

The default setting for On Line is checked.

Note: If the Show Status Bar option is selected, you can look at the "On Line" indicator that appears on the status bar at the top of your screen to determine whether or not the On Line option is checked.

#### Local Echo

This option is available only when the On Line option is checked. The settings for the Local Echo option determine whether or not characters that you type on the keyboard or on the numeric keypad (or select from the Keypad menu) are sent to your Macintosh screen (as well as to the remote computer with which your Macintosh is communicating).



As you enter characters, they are sent only to the remote computer, not to your Macintosh screen.

However, if you are sending or receiving in full duplex, all the characters that you enter are echoed back by the remote computer. So, the Local Echo option should be unchecked when the remote computer specifies full duplex in its communications parameters (that is, when it echoes back your keystrokes).



As you enter characters, they are sent to your Macintosh screen, as well as to the remote computer; all the characters that you enter are displayed on the Macintosh screen as you type them in.

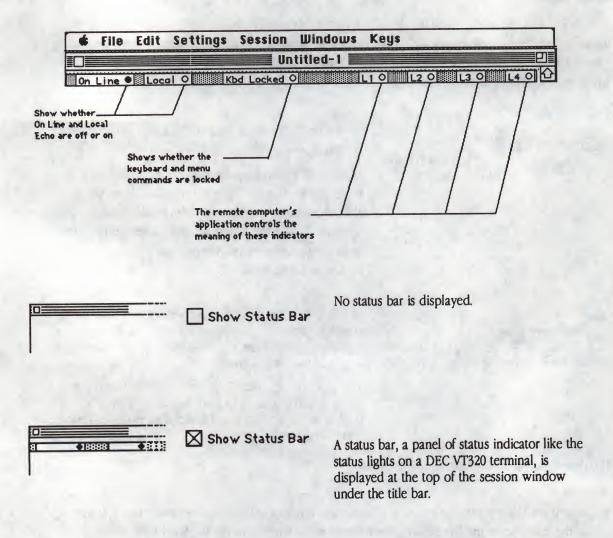
You should check Local Echo when the remote computer specifies half duplex in its communications parameters (that is, when the remote computer does not echo back your keystrokes).

The default setting for Local Echo is unchecked.

Note: If the Show Status Bar option is selected, you can look at the "Local" indicator that appears on the status bar at the top of your screen to determine whether or not the Local Echo option is checked.

#### Show Status Bar

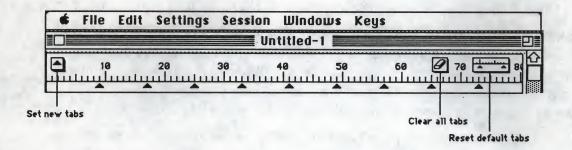
The settings for this option determine whether a status bar (similar to the status lights on a DEC VT320 terminal) appears at the top of the VT320 terminal emulation screen (above any tab ruler). An example of the status bar is shown below; if the light next to a label is on, the option is currently selected.

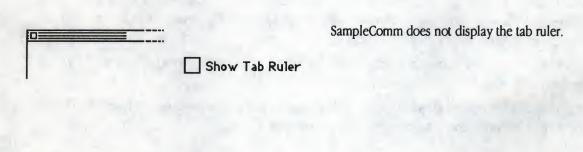


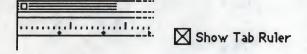
The default setting for Show Status Bar is unchecked.

#### Show Tab Ruler

The settings for this option determine whether a tab ruler displays at the top of the VT320 terminal screen. (The tab ruler displays below any status bar.)







SampleComm displays a tab ruler. Tabs can be set or cleared using the tab ruler. A button on the tab ruler lets you automatically set tabs every 8 spaces (for compatibility with typical VT320 terminal screens). Another button lets you to clear all tabs. A third button lets you automatically reset the default tab settings.

The default setting for Show Tab Ruler is unchecked.

#### Answerback

This option lets you enter the character string that is returned to the remote computer when an answerback character is detected in the incoming data stream. The answerback string provides an identification response to the remote computer. The remote computer specifies what this answerback string must be. You may need to send an answerback message when you're communicating with certain types of private computer systems. Most public information services don't require an answerback string.

The answerback string can contain from 0 to 30 characters. Some answerback messages require a control character—for example, the control character ^M designates a return character. You type the control character by using the Shift key to type the caret (^) above the number 6 key on the main keyboard and then typing the appropriate letter. Control characters are included in the 0-30 character count. <<Reviewers: It is still being determined whether the previous statement will be true in this tool.>>

In addition to using the answerback string as a required response to a host computer, you can use it when you're communicating with another Macintosh or other personal computer. The answerback string is a convenient way to let the other computer know that you've made contact.

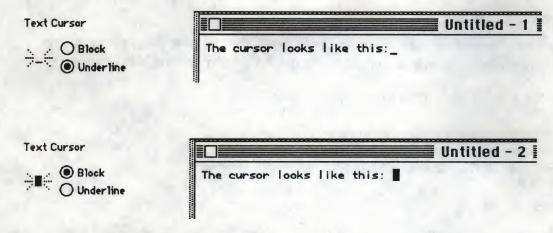
When communicating with a large computer system, SampleComm sends the answerback string that you've specified when the other computer requests it. Or, you can manually control transmission of the answerback string, using the following methods:

- Control-Enter sends the answerback string: Hold down the Control or Command key and press Enter.
   SampleComm sends the answerback string.
- Control-E asks for the answerback string: Hold down the Control or Command key and press E. The computer at the other end automatically sends its answerback message.

<<Reviewers: Can you help me devise a sample answerback string?>>

#### **Text Cursor**

The settings for this option determine whether the cursor is either a solid block or an underline, depending on which radio button is chosen.



The underline is the default setting for the Text Cursor option.

Lock	changes	to
------	---------	----

The two options in this group let you specify whether or not the host system can control certain emulation features.

#### User Features

The settings for this option determine whether or not the host system can make changes to the settings for the following features: Auto Repeat, Keyboard Lock, Inverse Video, Smooth Scroll, and Tab stops.

The host can change the settings for these features.

The host is unable to alter the settings for these features

The default setting for this option is unchecked.

#### Defined keys

The settings for this option determine whether or not the host system can change user-defined key definitions. (On the VT320, the user can define the functions of some top-row keys by using programming sequences).

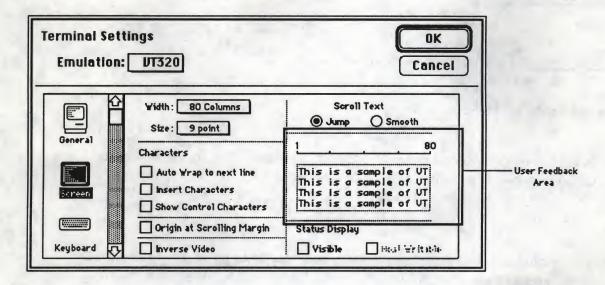
The host can redefine the user-defined keys.

The host cannot redefine the user-defined keys.

The default setting for this option is unchecked.

## Screen setup options

When you select the Screen icon in the VT320 setup dialog box, the setup options shown below are displayed.

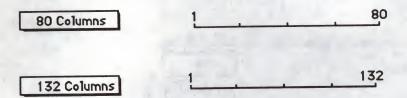


#### User-feedback area

The user-feedback area provides you with information about the settings you have chosen. When you change the settings in the Width, Size, Auto Wrap to Next Line, Scroll Text, or Inverse Video options, you will notice corresponding changes in the user-feedback area. Refer to the explanation of the individual options for information on how the area changes when you change the settings for specific options.

#### Width

This pop-up menu lets you set the horizontal width of the screen that displays during VT320 emulation. Two widths are supported: 80 characters per line and 132 characters per line. When you change the setting for the Width option, the scale in the user-feedback area of the dialog box changes accordingly.

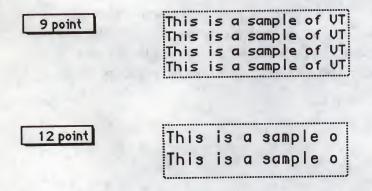


The default width is 80 characters per line.

♦ Note: When the Width option is changed, the terminal display area in your session document is cleared and the cursor is returned to the top left of the screen.

#### Size

This pop-up menu lets you set the font size of the characters that display on the screen during VT320 emulation. Two sizes are supported: 9 point and 12 point. When you change the setting for the Size option, the sample in the user-feedback area of the dialog box changes accordingly.



The default size is 9 point.

#### Characters

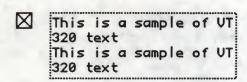
The three options in this group let you specify certain attributes of how character are handled while your Macintosh is emulating a VT320 terminal.

### Auto Wrap to next line

The settings for this option determine whether characters that would extend beyond the right margin wrap to the beginning of the next line. When you change the settings for this option, the sample in the user-feedback area of the dialog box changes accordingly.

This	is	a	sample	of	UT
			sample		
			sample		
This	is	a	sample	of	UT

When the cursor reaches the 80th or 132nd column, depending on the line length specified with the Width option, the cursor stops, and incoming characters write over the last character on the line until a new line character occurs in the incoming data stream.



When the cursor reaches the 80th or 132nd column, the VT320 tool automatically moves the cursor to the first column of the next line. Uncheck this option if the remote computer already provides this feature.

The default setting for this option is unchecked.

#### **Insert Characters**

The settings for this option determine whether characters are inserted between existing text or whether they write over existing text.

Characters are inserted to the right of the cursor—characters continue moving to the right as
new characters are inserted (characters moving past the right margin are lost). << What if Auto
Wrap is on?>>

Characters are written over the existing characters.

The default setting for Insert Mode is unchecked.

#### Show Control Characters

The settings for this option determine whether control characters display as readable characters.

- Control characters are not displayed as readable characters on the screen, but instead have their normal effect. For example, when a line feed is encountered, the cursor moves to the following line.
- Control characters display on the screen as they are encountered in the incoming data stream (and, when the Local Echo option is checked, as they are entered from the keyboard). Since displaying control characters may extend the line length, you may want to check the Auto Wrap to Next Line option so that the control characters can be inserted without causing characters to overwrite each other at the right-most column.

The default setting for this option is unchecked.

## Origin at Scrolling Margin

The settings for this option determine whether or not the cursor can move outside of the scrolling region (the area between the top and bottom margins). In addition, this option determines whether or not screen addressing is in absolute or relative coordinates.

- The cursor can be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on absolute coordinates, where line 1, column 1, is in the upper left corner of the screen, rather than within the scrolling region.
- The cursor cannot be positioned beyond the boundaries of the scrolling region. In this case, screen addressing is based on relative coordinates, where line 1, column 1, is in the upper left corner of the scrolling region.

The default setting for this option is unchecked.

#### Inverse Video

The settings for this option determine whether or not the Macintosh displays light text on a dark background or dark text on a light background. Normally, the Macintosh displays dark text on a light background. When you activate inverse video, light text appears on a dark background. When you change the setting for this option, the background and text in the user-feedback area of the dialog box change accordingly.





The default setting for Inverse Video is unchecked.

#### Scroll Text

The settings for this option determine whether character-stream induced scrolling takes place smoothly. Smooth scrolling slows down the rate at which the incoming data is received, but makes it easier to read rapidly scrolling lines. When you change these setting, the sample text in the user-feedback area scrolls accordingly in order to demonstrate the effects of the change you are making.

Incoming data scrolls at the same rate as it is received. When you change this setting, the text in the user-feedback area is cleared and then reappears on the screen, demonstrating the way that incoming text will be displayed.

Character-stream induced scrolling takes place smoothly. When you change this setting, the text in the user-feedback area scrolls smoothly out of the area, demonstrating the way that incoming text will be displayed.

The default setting for Scroll Text is Jump.

## Status Display

When selected, the status line appears in reverse video on line 25, the bottom line of the terminal emulation screen. Depending on how you set the following two options, the status line either

- does not appear
- shows the current position of the cursor
- shows a message from the host computer

<< Need sample screens that show these features.>>

#### Visible

s for this option determine whether or not a status line appears at the bottom of the screen also emulation.
The status line does not appear.
The status line appears. In this case, the status line will either show the current position of the cursor or, if the Host Writable option is checked, a message from the host computer.
t setting for this option is unchecked.

#### Host Writable

X

This option determines whether a message from the host computer is displayed in the status line; it is only available when the Visible option is checked, indicating that the status line should be displayed.

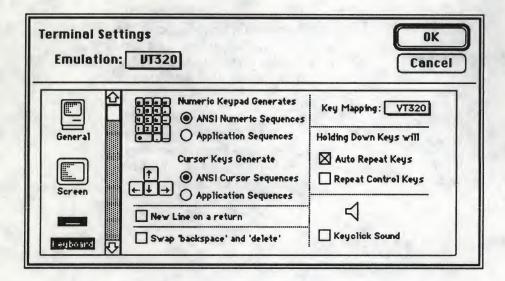
A message from the host computer displays in the status line.

The current cursor position, printer status <<???>>, and modem status appear in the status line.

The default setting for Host Writable is unchecked.

## Keyboard setup options

When you select the Keyboard icon in the VT320 setup dialog box, the setup options shown below are displayed.



## **Numeric Keypad Generates**

The settings for this option determine whether the keys on the keypad generate numeric characters or control characters, depending on which radio button is selected.



Numeric Sequences

The keys on the keypad generate characters that match the typical numeric, comma, period, and minus sign keys on the VT320-type keyboard (in accordance with ANSI specifications).



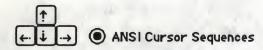
Application Sequences

The keys on the keypad generate special control functions (based on Digital Equipment Corporation specifications).

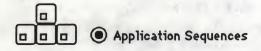
The default setting for this option is Numeric Sequences.

# **Cursor Keys Generate**

This settings for this option determine the characters transmitted when the Cursor (Arrow) keys are pressed.



When Cursor keys are pressed, ANSI cursorcontrol sequences are transmitted to the remote computer (see the table below).



When Cursor keys are pressed, cursor-control functions (specified by Digital Equipment Corporation) are transmitted to the remote computer (as shown in the table below).

The default setting for this option is ANSI Cursor Sequences.

#### Cursor Key Sequences

Cursor Key	<b>ANSI Sequences</b>			Application Sequences		quences	
Up Arrow	ESC	[	A	ESC	0	A	
	27†	91	65	27	79	65	
Down Arrow	ESC	[	В	ESC	0	В	
	27	91	66	27	79	66	
Left Arrow	ESC	[	C	ESC	O	С	
	27	91	67	27	79	67	
Down Arrow	ESC	[	D	ESC	0	D	
	27	91	68	27	79	68	
	† deci	mal value	es				

#### New Line on a return

The settings for this option determine whether line feed characters in incoming files are interpreted as carriage return/line feed pairs. In addition, this option determines what character(s) are sent when you press the Return key.

A line feed is interpreted as only a line feed (not as a carriage return/line feed pair). When a line feed character is received from the remote computer, the cursor moves down one line, but stays in the same column, rather than moving to the beginning of the line.

When you press the Return key, just a carriage return character is sent, which moves the cursor to the first position on the same line.

A line feed is interpreted as a carriage return/line feed pair. When a line feed character is received from the remote computer, the cursor moves to the first position on the next line. Use this option when incoming data does not move down to the beginning of the next line.

When you press the Return key, both a return and a line feed character are sent, which moves the cursor to the first position on the next line.

The default setting for this option is unchecked.

#### Swap 'backspace' and 'delete'

The settings for this option determine which character is sent when either the Backspace key (on the Classic keyboards) or the Delete key (on the ADB keyboards) is pressed.

On ADB keyboards:

- When the Delete key is pressed, a backspace character (ASCII 08) is sent.
- When the Delete key is pressed while holding down the Control key, a delete character (ASCII 127) is sent.

On Classic keyboards:

- When the Backspace key is pressed, a backspace character (ASCII 08) is sent.
- When the Backspace key is pressed while holding down the Command key, a delete character (ASCII 127) is sent.

On ADB keyboards:

- When the Delete key is pressed, a delete character (ASCII 127) is sent.
- When the Delete key is pressed while holding down the Control key, a backspace character (ASCII 08) is sent.

On Classic keyboards:

- When the Backspace key is pressed, a delete character (ASCII 127) is sent.
- When the Backspace key is pressed while holding down the Command key, a backspace character (ASCII 08) is sent.

The default setting for this option is unchecked.

# Key Mapping

This option is only used in international environments when you want to use a local keyboard mapping scheme (rather than the standard keyboard mapping scheme provided by the VT320 tool).

VT320 The standard VT320 keyboard mapping scheme is used.

US A local keyboard mapping scheme is used.

The default setting for this option is VT320. Unless a local keyboard mapping scheme is available with your implementation of this tool, you will be unable to modify this option. << Has this option been explained accurately?—it seems like this feature may be potentially confusing to the user. Byron and Mary are looking into this. >>

# Holding Down Keys will

The two options under this heading control key repetition.

#### Auto Repeat Keys

The settings for this option determine whether noncontrol characters repeat when the corresponding keys are held down.

You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

A character repeats when you hold down the corresponding key on the keyboard.

A character doesn't repeat when you hold down the corresponding key on the keyboard.

The default setting for Auto Repeat Keys is checked.

Note: To cause characters generated with Control key combinations (for example, the bell character and the line feed character) to repeat, the Repeat Control Keys option must be checked.

#### Repeat Controls

The settings for this option determine whether control characters repeat when the corresponding keys are held down. Control characters are characters generated by pressing particular keys while holding down the Command key or the Control key (for example: a bell character is generated by holding the Command or Control key and pressing G; a line feed by Control-J or Command-J).

A control character doesn't repeat when you hold down the corresponding key(s) on the keyboard.

A control character repeats when you hold down the corresponding key(s) on the keyboard.

You can use the keyboard icon in the Macintosh Control Panel desk accessory to specify the character repeat rate and the delay time before a character begins to repeat.

The default setting for Repeat Control Keys is unchecked.

♦ Note: To cause tab, backspace, and return characters to repeat, the Auto Repeat Keys option must be checked.

# **Keyclick**

The settings for this option determine whether or not an electronic sound (for example, a "beep") is made when a key is pressed. The Keyclick option has the following effects:

N

Clicks are not sounded when keys are pressed.

Keyclick Sound



A click is sounded each time you press a key. (If the keyboard is locked, there will be no keyclick sound, even if this option is checked.)

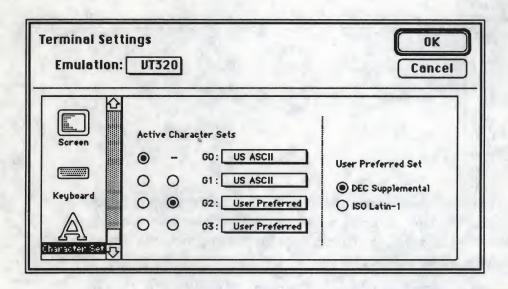
Keyclick Sound

The default setting for Keyclick is unchecked.

# Character Set Setup Options

When you select the Character Set icon in the VT320 setup dialog box, you have access to pop-up menus that allow you to specify the character sets for display on your Macintosh screen.

◆ Note: If you have selected VT52 mode, this screen is dimmed and cannot be configured.



A character set is a collection of characters that can be shown on a screen or used to code computer instructions. The VT320 tool supports sixteen different character sets (each of which contain a maximum of 128 characters) and allows you to use two of these characters sets at a time (making a total of 256 different characters available). Usually, you will only use the character set appropriate for your country and language; however, you might need the Graphics character set to do on-screen graphics, or a German character set, for example, to communicate with a multilingual mainframe.

Note: Since the VT320 tool allows you to use two character sets at a time, you will be able to use
the optional characters that are available on the Macintosh with key combinations that include the
Option key.

The VT320 Character Set setup dialog box contains four pop-up menus that you will use to specify character sets. All four menus (G0, G1, G2, and G3) contain identical lists of the characters sets supported by the VT320 tool (see the sample below).

MU: • US ASCII Graphics UK ASCII Norwegian Swedish-Finnish E47 Swedish-Finnish D47 German French French Canadian Spanish **Italian** Swiss Dutch Portuguese ISO Latin **DEC Supplement User Preferred** 

With the VT320 tool, at any given time, two character sets may be designated as the active character sets, the ones currently being used to display characters on the screen, and two others function as temporary character sets—the VT320 tool can switch to a temporary character set in order to generate one character and then switch back to the last active character set.

The VT320 tool also allows you to designate either the DEC Supplemental character set or the ISO Latin-1 character set as the user-preferred supplemental set, that is, the supplemental character set that you use most often.

When you are working off line or entering characters to be sent to a remote computer, you must set the character set options yourself (or use the preset defaults). However, when you are receiving data from a remote computer, although you can specify the character set to use for displaying data, the remote application may change your selection by

- changing the setting for which menu contains the active character set
- changing the character set selections on any of the menus

Usually, you won't notice these changes because most applications reset the setting to your original choices.

#### **Active Character Sets**

You use these pop-up menus (G0, G1, G2, and G3) to designate both the active character sets and the temporary character sets.

All the menus contain the same list of 16 character sets. US ASCII is the default for the G0 and G1 menus; the User Preferred character set (either DEC Supplemental or ISO Latin-1) is the default for the G2 and G3 menus. You can change the selection on any of these menus by pulling down the menu and clicking on a different character set.

You use the radio buttons next to the pop-up menus to specify which menus contain the current active character sets and which menus contain the temporary character sets. When a radio button next to a menu is on, the character set selected on that menu is used as one of the active character sets (at any time, you will only be able to set two buttons on). The character sets selected for the menus next to the radio buttons that are not on automatically function as the temporary character sets and are swapped in on a one-character-at-a-time basis.

There are two rows of radio button; the rows are used to determine which side of the code table the characters are mapped to. If the radio button on the left is on, the character set is mapped to the left side of the character code table (ASCII 0-127)—this is known as the GL set; if the radio button on the right is on, the character set is mapped to the right side of the character code table (ASCII 128-255)—and is known as the GR set. <<I could make this clearer to the user if these columns were labeled in the dialog box.>>

The character set specified in the G0 menu may be mapped only to the left side of the character code table (so no right-side radio button appears next this menu); the character sets from the other menus may be mapped to either side of the character code table. However, the DEC Supplement character set and the ISO Latin character set are usually assigned as the GR set; if you assign either of these character sets as the GL set, they will take on unexpected values.

The following is a summary of the character sets available on the VT320 character set menus:

US ASCII The standard set of letters, numbers, and symbols used in North American English

computers. When you specify US ASCII as the active GL Set character set, the characters generated by Macintosh key combinations that include the Option key

are available.

Graphics The set of graphics characters used to create line drawings on a VT320 terminal.

International UK ASCII—the same as US ASCII but with the pound sterling symbol (£) instead of

the number sign (\*); Norwegian, Swedish-Finnish E47, Swedish-Finnish D47, German, French, French-Canadian, Spanish, Italian, Swiss, Dutch, Portuguese—

various character sets with accented characters. Note that the keyboard layouts for these character sets follows the DEC standard and may be different from the Macintosh keyboard layout for that country. Only one international character set at a time can be designated as active. <<TRUE?>>

ISO Latin A multinational character set. Generally, this character set should be assigned as the

GR set option, rather than the GL set option.

DEC Supplement DEC supplemental graphics character set. Generally, this character set should be

assigned as the GR set option, rather than the GL set option.

User Preferred A supplemental character set that is designated as a special standby set. You use the

radio button under User Preferred Set to designate either DEC Supplemental or ISO

Latin-1 as this special standby set.

◆ Note: See the DEC VT320 Programmer's Guide for additional details on these character sets.

#### **User Preferred Set**

This option lets you designate the supplemental character set that you use most often (either DEC Supplemental or ISO Latin-1) as a special standby set. Designating a user-preferred supplemental set provides applications with an easy way to access the supplemental set. The host does not have to confirm that you are using either the DEC Supplemental character set or the ISO Latin-1 character set; it just sends the characters and lets the terminal determine which set to use for receiving the characters.

DecSupplemental
The DEC Supplemental character set is the user-preferred character set.

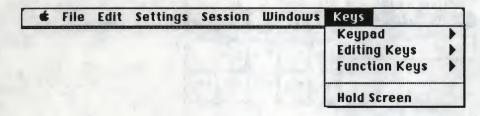
DEC Supplemental is the default user-preferred character set.

# VT320 keys emulation

There are some keys on VT320 keyboards that do not exist on the Macintosh keyboards; the VT320 tool has made provisions for you to emulate the keys.

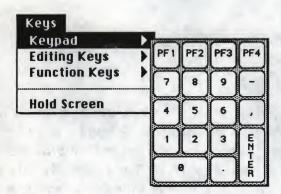
In some cases, the VT320 tool has mapped the VT320 keys to certain key combinations on the Macintosh keyboards. In other cases, you choose the key from a Keys menu that appears in the menu bar at the top of your Macintosh screen during VT320 emulation. Frequently, you can emulate the VT320 keys either from the Keys menu or with key combinations.

## The Keys menu

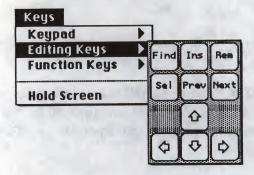


There are three submenus in the VT320 Keys menu:

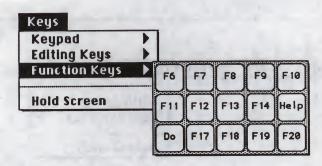
the numeric keypad



the Editing keys



the Function keys



When you select a key cell from one of these menus, it produces the same result as when you press the corresponding physical key on the keyboard.

◆ Note: Holding down the Shift key while selecting a Function Key cell generates the corresponding user-defined function sequence.

The fourth item on the Keys menu, "Hold Screen", is available only when the connection tool being used for the session is setup to use the XON/XOFF handshake protocol; otherwise, this item is dimmed and unavailable. The Hold screen item lets you toggle between sending an XOFF to halt scrolling and sending an XON to restart scrolling. (Equivalent control sequences are Control-Q for XOFF and and Control-S for XON respectively.) When the screen is held (that is, when the screen does not scroll), the Hold Screen menu item is checked.

## Control keys

On ADB keyboards, there is a Control key.

On Classic keyboard, the Command key serves as the Control key (this means, that you can't use the Command key for keyboard shortcuts).

## Cursor keys

Cursor keys (Arrows) exist on Classic Extended keyboards, on Classic Keypads, and on ADB keyboards. They are also emulated in the Keys menu.

## **Editing** keys

The equivalent of the VT320 Editing keys can be generated with the Keys menu. In addition, on the Extended ADB keyboard editing key can be generated with the following Command key combinations:

Command key plus	VT320 Editing Key		
	Find		
	Select		
;	Insert		
	Remove		
,	Previous Screen		
	Next screen		

<sup>&</sup>lt;<Tamara: can we do this with art?>

#### **Escape Key**

On ADB keyboards, there is an Escape key.

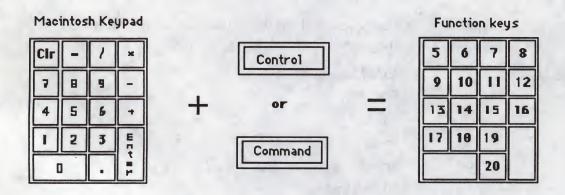
On Classic keyboards, the upper right key, the tilde/accent grave (~/`) is used for the Escape key. To generate a tilde (~), use Command-`; to generate an accent grave (`), use Command-Shift-`.

#### **Function keys**

The equivalent of the VT320 function keys can be generated with the Keys menu.

In addition, the Extended ADB keyboard contains Function keys that can be used to emulate the VT320 function keys. However, the Extended ADB keyboard contains function keys F1 through F15, while the VT320 keyboard contains Function keys F6 through F20. The discrepancy is resolved by mapping Fx on the Extended ADB keyboard to F(x+5) on the VT320—for example, to generate a VT320 F6, use F1 on the Extended ADB keyboard.

You may also generate Function keys on Macintosh keyboard by using the Keypad keys in combination with the Command key (or the Control key on ADB keyboards), as shown below.



Note: To generate characters streams for user-defined VT320 function keys, hold down the Shift key and the Control or Command key, while pressing the appropriate Keypad key.

#### Hold Screen

This key is simulated in the "Keys" menu.

#### Keypad

The VT320 keypad physically maps one-to-one to the Macintosh keypad on the Classic Extended keyboards, on Classic Keypads, and ADB keyboards. In addition, since older Classic keyboards do not include a Keypad, the VT320 Keypad keys are emulated in the Keys menu.

# Keyboard mapping

The following VT320 keys do not have equivalent keys on all Macintosh keyboards and so have been mapped to the Keys menu, to keyboard combinations on the Macintosh keyboards, or to both:

- Backspace/Delete
- Break
- Compose Character
- Control
- Cursor keys
- Editing Keys
- Escape
- Function Keys
- Hold Screen
- Keypad
- Line Feed
- Print Screen
- Set Up

The subsections that follow explain how to emulate each of these VT320 keys with the VT320 tool. At the back of this binder, you will find a quick-reference card for the VT320 key mappings. <<Not in this draft.>>

# Backspace/Delete keys

On the Classic keyboards, there is a Backspace key. On the Apple Desktop Bus™ (ADB) keyboards, there is a Delete key (which transmits a backspace character on its own and a delete character when pressed with a Control key).

On ADB keyboards, the mapping for VT320 emulation is handled as follows:

Delete

generates a backspace character

Control-Delete

generates a delete character

You may swap these functions by changing the setting for the Swap 'backspace' and 'delete' option on the Keyboard setup screen.

On Classic keyboards, the mapping for VT320 emulation is handled as follows:

Backspace generates a backspace character

Command-Backspace generates a delete character

Again, you may swap these functions by changing the setting for the Swap 'backspace' and 'delete' option on the Keyboard setup screen.

### Break keys

On the VT320 keyboard, the Break key performs the following three different functions:

Break generates a short break to interrupt the flow of data

Shift-Break generates a long break disconnect, which usually disconnects the terminal from the

communication line

Control-Break generates the answerback message

On any Macintosh keyboard, use the following:

Option-Enter to generate a short break

Shift-Enter to generate a long break

Command-Enter to generate an answerback message

The effect of a short break character is connection-protocol dependent. When the serial driver is being used, a <<short?>> break character causes the Data Terminal Ready (DTR) signal to be dropped. With ADSP, breaks have no effect.

# Compose Character key

The Compose Character key on the VT320 keyboard lets you use more characters than appear on the VT320 keyboard. On the VT320, you can compose a character by typing the Compose Character key and then a sequence of three other keys.

On Macintosh keyboards, you use Option key combinations to generate nonstandard characters. If the character generated by the Option key combination is not a valid VT320 character, it is ignored.

#### Line Feed

On all Macintosh keyboards, a line feed is generated with the Option-Return key combination.

#### **Print Screen**

To print the screen, use the File menu.

# Setup

Instead of providing a keyboard equivalent to the VT320 Setup key, the VT320 emulation tool lets you use the Settings dialogs for setup operations.

# Trouble-shooting hints

Most problems that you encounter while using the VT320 terminal emulation tool are caused by mismatched communications parameters—the settings that you have chosen are not compatible with the settings for the computer with which you are communicating. If data is not being sent and received correctly, compare the settings for the communications attributes; keep in mind that the problems could also be caused by mismatched settings for the connection tool or the file transfer tool being used for the session.

Make sure that the settings for the VT320 tool setup options match the requirements of the remote computer. Here are some suggestions for how to correct some of the problems you could encounter when the setup options are not set correctly:

#### If nothing gets sent or received

Make sure that the On Line option is checked. When you are unable to send or receive data, you may also need to check the physical connections and/or the setup options for the connection tool being used for the session.

- If nothing appears on the screen when you send or receive data Check the Local Echo option.
- If the data appears as double characters Uncheck the Local Echo option.
- If characters that you enter do not appear on the screen and if your Macintosh beeps with each keystroke

The keyboard is locked. Unlock the keyboard by selecting the Hold Screen item from the Keys menu or by pressing Control-Q. (If the Hold Screen menu item is unavailable or if Control-Q does not work, make sure the the XON/XOFF handshake protocol is selected in the connection tool being used for the session.)

- If incoming data writes over the last character on the first line
  - Check the Auto Wrap to Next Line option and the New Line on a Return option.
- If lines of incoming data are double-spaced Uncheck the New Line on a Return option.
- If incoming data writes over the same line Check the New Line on a Return option.

- If nothing appears on the screen when you send or receive data

  Check the Local Echo option.
- If the cursor is not visible on the screen

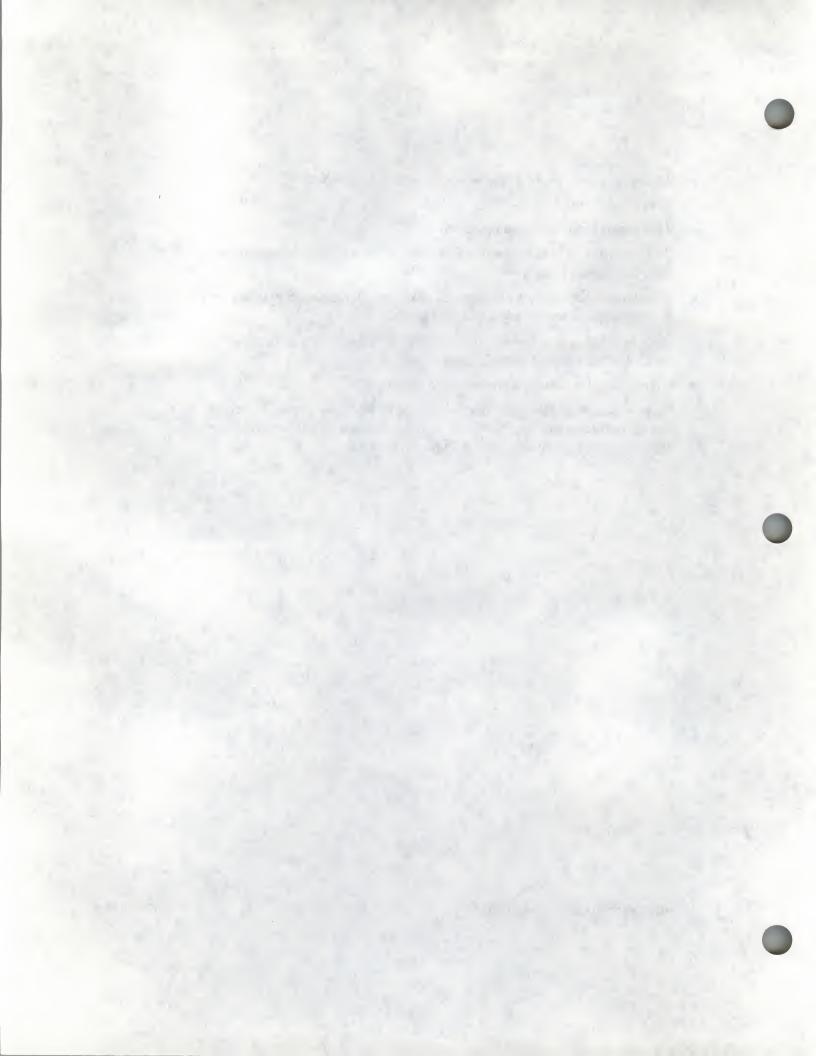
The cursor may have been scrolled out of the visible screen, click on the active scroll bar to scroll the cursor back into the visible screen.

■ If the terminal is displaying unexpected characters (for example, graphics characters or characters from a non-US ASCII character set)

Check the setting on the Character Set setup screen; make sure that the active character set is G0 and that US ASCII is designated as the G0 character set.

■ If the terminal is echoing unrecognizable characters

The terminal may be in the wrong mode—check the setting for the Terminal Mode option in the General setup dialog box. The VT320 mode should be selected in an 8-bit environment; the ANSI/VT102 mode should be selected in a 7-bit environment.



# Part II Connection Tools

This part of your guide describes the connection tools that accompanied your SampleComm application. A connection tool is software that allows one computer to establish a connection with another computer. With SampleComm, you can establish either a direct serial connection to the another device or you can connect to a remote device (such as a mainframe host computer) through a modem. The modules in this part of your guide describe how to set up your Macintosh to connect to another computer using the following connection tools included with SampleComm:

Serial connection tool primarily for direct connection between

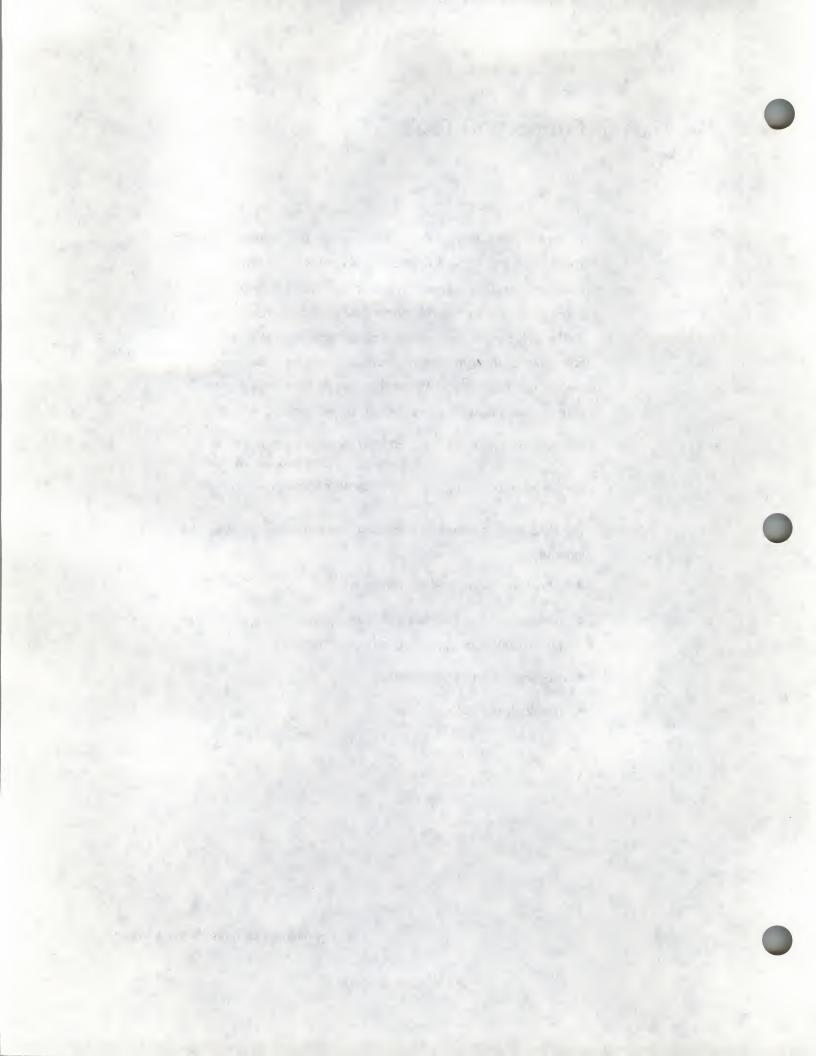
computers in close proximity of each other

Modem connection tool for connecting with remote systems via a

modem

The discussions for each of the connection tools provide the following information:

- a functional overview of the connection tool
- descriptions of the configuration options used to set up your Macintosh to communicate using the specified type of connection
- alert and status message definitions
- trouble-shooting hints



# **Serial Connection Tool**

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Hold Connection / 8
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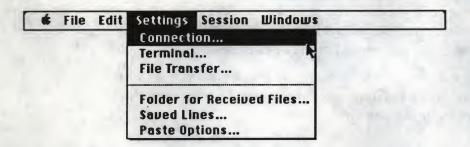
The Serial connection tool allows you to transmit data in serial format; that is, one bit after another over a single wire. You can use the Serial connection tool to establish a direct connection between two computers that are close enough to each other to be directly linked via local cables that connect to the serial ports on each of the computers. You can also use the Serial connection tool in conjunction with a modem to establish a connection to a remote computer; however, the Serial connection tool does not include automatic dialing features (use the Modem connection tool when you want to take advantage of automatic dialing).

In addition to letting you establish connections through the two serial ports that are built in to the Macintosh, the Serial connection tool allows you to establish connections through serial cards installed in your Macintosh (for example, through an Apple Serial NB Card or a SuperMac CommCard).

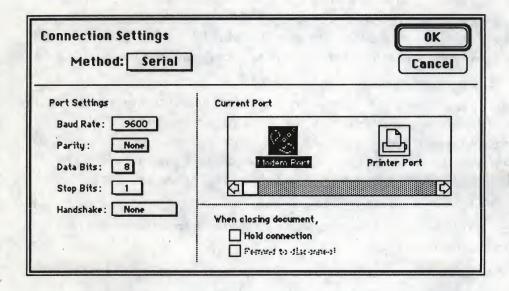
The Serial connection tool lets you select the baud rate (at speeds ranging from 50 to 57,600 baud) and set other data transmission parameters, such as parity, data bits, stop bit size, and handshake protocol. In addition, you can specify that you want to maintain the serial connection although you are closing the current session document.

# Serial connection settings

You choose the Connection command from the Settings menu (shown below) to access a dialog box that lets you set connection attributes.



When you choose Serial from the Method pop-up menu in the Connection Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to communicate over a serial connection (see below).



# Setup options

For each option in the Serial Connection Settings dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings depending on the type of information being transmitted or on the communications requirements of computer that you are connecting to. In these cases, you should refer to the documentation for the other computer or contact your system's administrator for information on how the various options should be set for the communications environment that you are establishing.

The following subsections describe the connection setup options that are available in the Serial Connection Settings dialog box. The options are presented in order as they appear in the dialog box (moving from top to bottom and from left to right).

## Port Settings

The pop-up menus in this group allow you to set port-specific features, including baud rate, parity, number of bits per character, stop bit size, and handshake protocol.

#### Baud

You use this option to regulate the speed at which data is transmitted between computers. The baud rate is usually the number of bits sent per second; however, more precisely, the baud rate is the number of times per second that a transmission signal varies (sometimes this may be somewhat different from the number of bits sent per second). Both your Macintosh and the computer it is communicating with must transmit data at the same baud rate.

The baud pop-up menu lets you choose from a variety of rates, ranging from 50 to 57600. In general, Macintosh computers support all of the baud rates available on this pop-up menu. The user manuals for any other computers that you are connecting to should tell you what baud rates these computers can transmit at. If you are connecting to a local computer system, such as a VAX, you can contact the system's administrator for information on baud rate capabilities. If you are connecting via a modem, the baud rate will be limited to the capabilities of the modem.

The default baud rate is 9600. However, when computers are directly attached to each other, they are likely to be able to communicate at even higher baud rates.

♦ Hint: If incoming data is garbled (or missing), your baud rate setting may not match that of the other computer.

#### Parity

This menu lets you choose the method used by your Macintosh and the other computer for checking that data isn't garbled during transmission. The Serial connection tool allows you to use Even or Odd parity checking, or to specify None, indicating that no parity checking will be performed. <<What should the user do if there setup instructions tell them to use mark parity or space parity--should I tell them this?--should I point out that we aren't supporting these parities.>>

You may choose either of the parity settings, so long as the other computer is also set up to use the same parity. When you are establishing a connection with another Macintosh computer, you may choose any parity settings (but, both Macintoshes must use the same setting). If you are connecting to an information service or to a remote computer, their set-up instructions should indicate what parity to use. If you aren't sure what parity to use, contact the appropriate system's administrator.

The default setting for parity checking is None.

♦ Hint If rectangular boxes are scattered throughout garbled incoming data, there is a good possibility that your parity setting does not match that of the other computer. (Occasionally, however, this situation is also caused by character set discrepancies).

#### Data Bits

This menu lets you specify the number of bits that comprise a character. With the Serial connection tool your Macintosh can send and receive 5-, 6-, 7-, or 8-bit characters, whichever the other computer requires.

The default setting for this option is 8-bit characters. In general, you will be able to leave this option at the 8-bit setting, as characters of the other sizes will also be recognized. However, if the remote application cannot interpret 8-bit characters, the data you send will be garbled, and you will need to try a lower number of bits per character.

#### Stop Bits:

You use this menu to specify the length of the stop bit. A stop bit is a data bit that marks the end of a transmitted character. Your Macintosh and the computer it is communicating with use the stop bit to synchronize communication. With the Serial connection tool you may use 1, 1.5, or 2 stop bits.

When you are establishing a connection with another Macintosh computer, you may choose any stop-bit settings (however, both Macintoshes should use the same setting). If you are connecting to an information service or remote computer, their set-up instructions should indicate what stop bit setting to use. If you aren't sure what stop-bit size to use, contact the appropriate system's administrator.

<Should I tell the user that probably nothing will happen if the stop bit settings don't match, unless they are using a slow-speed connection for TTY?>>

Typically, a stop bit is 1-bit long; this is the default setting for this option.

#### Handshake

This menu lets you specify the protocol used to regulate the flow of data between your Macintosh and the other computer. The other computer must support the same handshake protocol that your Macintosh is using. The Serial connection tool offers the following handshake options:

None

SampleComm doesn't regulate the flow of data from the other computer, nor does SampleComm respond to the other computer's attempts to regulate the flow of data from your Macintosh (SampleComm interprets any XON or XOFF characters sent by the other computer as data).

If the other computer sends information faster than SampleComm can receive it, characters will be missing from incoming data. In this case, you can try a slower baud rate. You can also try deactivating the Save Lines Off Top command from the Session menu, thus speeding up SampleComm's ability to process incoming data (however, this command does not affect the rate of data flow during file transfer).

XON/XOFF

SampleComm regulates the flow of data between your Macintosh and the other computer. Using XON/XOFF prevents the loss of data when either SampleComm or the other computer sends characters faster than the other computer can receive them.

Usually, you won't need to use the XON/XOFF protocol for a baud rate of 1200 or slower. However, some commercial services, such as MCI Mail, require XON/XOFF for controlling data flow.

When you have selected the XON/XOFF protocol, you can use the No Scroll item on the VT102 Keys menu and the Hold Screen item on the VT320 Keys menu to stop and start scrolling (or, you can use Control-S to stop scrolling and Control-Q to start scrolling).

DTR & CTS

Accommodates connections where flow control is obtained via Data Terminal Ready (DTR) and Clear To Send (CTS) hardware handshake protocols.

DTR Only

Accommodates connections where the DTR hardware handshake protocol is the only means of flow control.

CTS Only

Accommodates connections where the CTS hardware handshake protocol is the only means of flow control.

The default setting for Handshake is None. But, you'll usually want to use the XON/XOFF protocol for baud rates over 1200 if the other computer supports the protocol.

#### **Current Port**

You use the port icons to specify which connection port on the back of your Macintosh connects to the cable than runs to the other computer (or attaches to a modem). In a minimum configuration, two port icons will appear in the scrolling region; these icons will look the same as those that identify the ports on the back of the Macintosh.



<<Close-up figure showing where this port is located on the back of the Mac>



<<Close-up figure showing where this port is located on the back of the Mac.>>

You may use either port when establishing a connection. However, the Modem port is most suitable for high-speed communication (Besides, the Printer port is likely to already be in use for the AppleTalk® Network system, since the LocalTalk™ connection is established through the Printer port.)

If additional serial ports are available on your Macintosh, icons for these ports should also appear in the scrolling region. For example, if you have an Apple Serial NB Card installed, the corresponding port icon appears in the scrolling region (as shown below).

<<Reviewers: I need a screen shot of this icon.>>

♦ Note: If you have a third-party serial card installed in your Macintosh, but the port icon does not appear in the scrolling region, contact the manufacturer to determine why the card is not being recognized by the Macintosh Communications Toolbox (that is, to determine why the card is not registering itself with the Communications Toolbox).

#### When closing documents...

The two options in this group allow you to specify whether you want the remote computer to keep your connection open, even after you have closed the current session document.

#### Hold Connection

冈

The settings for this option determine whether the remote computer holds your connection open after you a close the session document.

The connection is broken when the session document is closed.

The remote computer holds the connection open when the session document is closed. Although, the connection is reserved for you by the remote computer, when you open a new session document, you will still have to issue the Open Connection command (from the Session menu) in order to start communicating with the remote computer.

When the Hold Connection option is checked, the Remind to Disconnect option is also available to you. If you have checked the Remind to Disconnect option, when you close the session document, a dialog box reminding you that connection is remaining open (and giving you the chance to close it) is displayed.

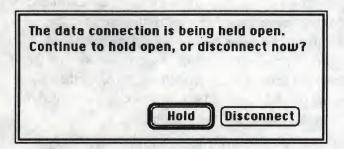
You can break a connection that has been held open by quitting from SampleComm or by issuing the Close Connection command (from the Session menu). Since this command is only available after you issue the Open Connection command, you must open a new session document and choose Open Connection in order to access the Close Connection command.

The default setting for this option is unchecked.

#### Remind to Disconnect

This settings for this option determine whether an alert box appears notifying you that the connection is remaining open although you are closing the current session document and giving you the opportunity to choose to close the connection. (The Remind to Disconnect option is dimmed and unavailable when the Hold Connection option is unchecked.)

- When you close the session document, the connection remains established, but you are not notified of this.
- When you close the session document, an alert box (shown below) reminds you that the connection is remaining open and allows confirm that you want to hold the connection open or choose to disconnect.



The default setting for this option is unchecked.

### Alerts

While you are using the Serial connection tool, the following alerts may appear:

- Sorry The serial port selected is not presently available.
   Choose another serial port.
- Modifying the current connection may cause the connection to close. Proceed?

  If you don't mind losing the connection, click O.K.; otherwise click Cancel.

# Trouble-shooting hints

Most problems that you encounter while using the Serial connection tool are caused by mismatched communications settings—the settings that you have chosen do not match the settings of the computer with which you are attempt to communicate (or for the modems that are being used). If you are unable to establish a connection when you choose the Open Connection command from the Commands menu or if the data being transmitted arrives garbled, compare the setting for the communications attributes. Keep in mind, that the problems could also be caused by mismatched settings for the terminal emulation tool or the file transfer tool that you are using.

Since the Serial connection tool is generally used between computers that are directly connected, if you can't establish a connection, it is also a good idea to make sure all the cables are properly connected.

# **Modem Connection Tool**

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Redial ... times, every ... seconds / 6
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```

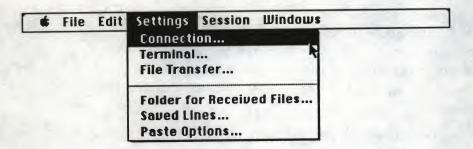
The Modem connection tool lets you transmit data to a remote computer via a modem attached to your Macintosh. The Modem tool provides connection through the two serial ports that are built in to the Macintosh and automatically sets up an attached Apple, Hayes, or Hayes-compatible modem. In addition to letting you establish a connection through the two built-in serial ports, the Modem tool allows you to establish similar connections through serial cards installed in your Macintosh (for example, through an Apple Serial NB Card or a SuperMac CommCard).

With the Modem tool, you can specify what mode the modem is going to be in; either answer mode or dial mode. When answer mode is selected, you can specify the number of rings the modem should wait before answering. When dial mode is selected, you can enter the destination phone number, the redial count, the redial interval, and the type of dial tone.

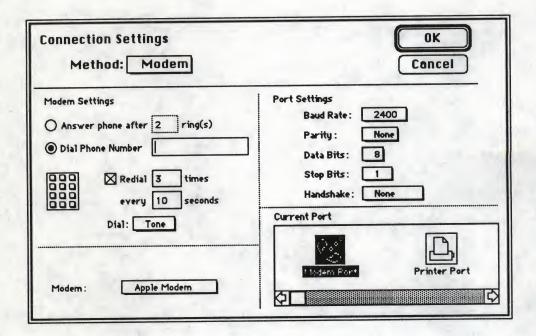
In addition, the Modern connection tool, lets you select the type of modern being used, as well as set data transmission parameters, such as baud rate, parity, data bits, stop bit size, and handshake protocol.

# Modem connection settings

You choose the Connections command from the Settings menu (shown below) to access a dialog box that lets you set connection attributes.



When you choose Modem from the Method pop-up menu in the Connection Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to communicate over a Modem Connection (see below).



# Setup options

For each option in the Modem Connection Settings dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings depending on the type of modem you are using, on the type of information being transmitted, or on the communications requirements of the remote computer. In these cases, you should refer to the documentation for your modem or for the remote computer or contact your system's administrator for information on how the various options should be set for the communications environment that you are establishing.

The following subsections describe the connection setup options that are available in the Modem Connection Settings dialog box. The options are presented in order as they appear in the dialog box (moving from top to bottom and from left to right).

### Modem Settings

You use the options in this group to specify whether the modem is operating in answer mode or in dial mode, as well as to set mode-specific features. If the modem is in answer mode, you can specify the number of rings before a call is answered; if the modem is in dial mode, you can specify the access phone number and the dialing conventions.

O Answer phone after 2 ring(s)

Answer mode. Specifies the number of times the phone will ring before the modem answers the call, thus establishing the connection. You can specify any number of rings between 1 and 256. See your modem manual for details on establishing the number of rings. The default setting is 2 rings.

The modem does not answer the call if 0 rings is specified, so if you enter 0 rings, the Modem tool automatically changes the setting to the default of 2 rings. <Should the user receive online notification that this is happening?>>

Dial Phone Number	

Dial mode. The text edit field in this option lets you enter the access phone number of the remote computer that you want to communicate with. If you have already entered a number, it appears selected (highlighted), and you can replace it by typing another number.

A comma after a number causes the modem to pause before dialing the remaining numbers. Use a comma when entering a number used to get an outside line or whenever you dial a number and then wait for a dial tone. Refer to your modem manual for further information on giving instructions to your modem.

The other options in this group (those used for specifying the dialing conventions) become available when you select this mode.

The default settings for this option is dial mode (Dial Phone Number ...).

#### Redial ... times, every ... seconds

This option is only available when dial mode is chosen; you can use it to specify the number of times to redial the phone number for the remote computer and the duration between redials.

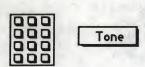
When an attempt to establish phone connection with a remote computer is unsuccessful, the phone number will be redialed the specified number of times, allowing the specified duration (in seconds) between each redial.

When an attempt to establish phone connection with a remote computer is unsuccessful, no attempt is made to redial the phone number.

The default setting for this option is checked, with 3 redial attempts 10 seconds apart.

#### Dial

This pop-up menu is only available when dial mode is chosen; it lets you choose the dialing method used for the connection. Tone, Pulse, and Mixed are types of transmission signals used by telephone companies. As you change dialing methods, you will notice the graphic representing the method will change.



Tone is the most common transmission signal in use today; it is used with most push-button phones.



Pulse is used with many rotary-dial telephones and is still found in parts of the United States.



Mixed

Mixed dialing (a combination of both tone and pulse) is used when part of the phone number is in pulse and part of the number is in tone.

One case where you would use the mixed dialing method would be when you are dialing in to an electronic banking service from a pulse phone. Although you may be able to access the service through the pulse dialing method, you would then have to enter a password extension in tone numbers. In this case, you would type an uppercase P before the pulse number for the service and a T before the tone extension. For example, P4155551212,T1678.

Mixed dialing is also used where a tone system exists within a building but the region still uses a pulse system. In this case, the part of the number that gets you an outside line (9, for instance) will be in tone and and the rest of the number is in pulse. When you type the phone number, you would type an uppercase T before the tone numbers and an uppercase P before the pulse numbers. For example T9,P4155551212.

The tone dialing method is the default.

#### Modem:

You use this pop-up menu to specify the type of modem being used for the connection.

Apple Modem

An Apple modem is being used for the connection.

Hayes-Compatible

A Hayes or Hayes-compatible modem is being used for the connection. Most Hayes-compatible modems are supported with the settings, including <PQS: please provide a list of the modems you test, including any incompatibilities that are going to stand>>.

The default setting for this option is Apple Modem.

### Port Settings

The pop-up menus in this group allow you to set port-specific features, including baud rate, parity, number of bits per character, stop bit size, and handshake protocol.

#### Baud

You use this option to regulate the speed at which data is transmitted between computers. The baud rate is usually the number of bits sent per second; however, more precisely, the baud rate is the number of times per second that a transmission signal varies (sometimes this may be somewhat different from the number of bits sent per second). Both your Macintosh and the computer it is communicating with must transmit data at the same baud rate (unless you are using a modem that adjusts the sending baud rate to match the requirements of the remote modem, for example, the Apple Data Modem 2400, in which case, the baud rate for the Macintosh may be any rate that the local modem can handle).

The Baud pop-up menu lets you choose from a variety of rates, ranging from 50 to 57600. The baud rate you choose is determined by the capabilities of your modem and those of the modem at the receiving end. Most modems transmit at 300 or 1200 baud over telephone lines (although 2400-baud modems are becoming increasingly popular). You usually use the other speeds for transmitting to a computer that is directly attached.

The default baud rate is 2400.

◆ *Hint*: If incoming data is garbled (or missing), your baud rate setting may not match that of the other computer.

#### Parity

This menu lets you choose the method used by your Macintosh and the other computer for checking that data isn't garbled during transmission. The Modem connection tool allows you to use Even or Odd parity checking, or to specify None, indicating that no parity checking will be performed. <<What should the user do if there setup instructions tell them to use mark parity or space parity--should I tell them this?--should I point out that we aren't supporting these parities.>>

You may choose either of the parity settings, as long as the other computer is also set up to use the same parity. The documentation for the information service or remote computer that you are accessing should tell you what parity setting to use. When you are establishing a connection with another Macintosh computer, you may choose any parity settings (but, both Macintoshes must use the same setting). If you aren't sure what parity to use, contact the appropriate system's administrator.

The default setting for parity checking is None.

Hint: If rectangular boxes are scattered throughout garbled incoming data, there is a good possibility that your parity setting does not match that of the other computer. (Occasionally, however, this situation is also caused by character set discrepancies).

#### Data Bits

This menu lets you specify the number of bits that comprise a character. With the Modem connection tool, your Macintosh can send and receive 5-, 6-, 7-, or 8-bit characters, whichever the other computer requires.

The default setting for this option is 8-bit characters. In general, you will be able to leave this option at the 8-bit setting, as characters of the other sizes will also be recognized. However, if the remote application cannot interpret 8-bit characters, the data you send will be garbled, and you will need to try a lower number of bits per character.

#### Stop Bits:

You use this menu to specify the length of the stop bit. A stop bit is a data bit the marks the end of a transmitted character. Your Macintosh and the computer it is communicating with use the stop bit to synchronize communication. With the Modem connection tool you may use 1, 1.5, or 2 stop bits.

The documentation for the information service or remote computer that you are accessing should tell you what stop-bit setting to use. When you are establishing a connection with another Macintosh computer, you may choose any stop-bit settings (however, both Macintoshes should use the same setting). If you aren't sure what stop bit to use, contact the appropriate system's administrator.

<Should, I tell the user that probably nothing will happen if the stop bit settings don't match, unless they are using a slow speed connection for TTY?>>

Typically, a stop bit is 1-bit long; this is the default setting for this option.

#### Handshake

This menu lets you specify the protocol used to regulate the flow of data between your Macintosh and the other computer. The other computer must support the same handshake protocol that your Macintosh is using. The Modem connection tool offers the following handshake options:

None

SampleComm doesn't regulate the flow of data from the other computer, nor does SampleComm respond to the other computer's attempts to regulate the flow of data from your Macintosh (SampleComm interprets any XON or XOFF characters sent by the other computer as data).

If the remote computer sends information faster than SampleComm can receive it, characters will be missing from incoming data. In this case, if you can, try a slower baud rate. You can also try deactivating the Save Lines Off Top command from the Session menu, thus speeding up SampleComm's ability to process incoming data. (however, this command does not affect the rate of data flow during file transfer).

XON/XOFF

SampleComm regulates the flow of data between the Macintosh and the other computer. Using XON/XOFF prevents the loss of data when either SampleComm or the other computer sends characters faster than the other computer can receive them.

Usually, you won't need to use the XON/XOFF protocol for a baud rate of 1200 or slower. However, some commercial services, such as MCI Mail, require XON/XOFF for controlling data flow.

When you have selected the XON/XOFF protocol, you can use the No Scroll item on the VT102 Keys menu and the Hold Screen item on the VT320 Keys menu to stop and start scrolling (or, you can use Control-S to stop scrolling and Control-Q to start scrolling).

The default setting for Handshake is None. But, you'll usually want to use the XON/XOFF protocol for baud rates over 1200 if the other computer supports the protocol. In addition, some information services require XON/XOFF protocol.

#### **Current Port**

You use the port icons to specify which connection port on the back of your Macintosh connects to the cable that attaches to the modern. In a minimum configuration, two port icons will appear in the scrolling region; these icons will look the same as those that identify the ports on the back of the Macintosh.



<<Close-up figure showing where this port is located on the back of the Mac>



<<Close-up figure showing where this port is located on the back of the Mac.>>

You may use either port when establishing a connection. However, the Modem port is most suitable for high-speed communication. (Besides, the Printer port is likely to already be in use for your AppleTalk® Network system, since the LocalTalk™ connection is established through the Printer port.)

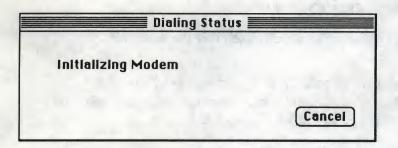
If additional serial ports are available on your Macintosh, icons for these ports should also appear in the scrolling region. For example, if you have an Apple Serial NB Card installed, the corresponding port icon appears in the scrolling region (as shown below).

<< Reviewers: I need a screen shot of this icon.>>

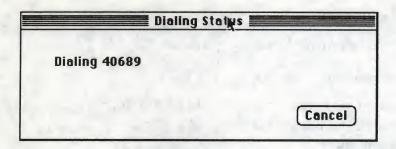
Note: If you have a third-party serial card installed in your Macintosh, but the port icon does not appear in the scrolling region, contact the manufacturer to determine why the card is not being recognized by the Macintosh Communications Toolbox (that is, to determine why the card is not registering itself with the Communications Toolbox).

## Dialing status

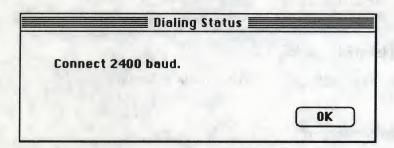
After you use the Initiate Connection command, the Modem tools displays a status screen that provides you with information about the connection attempt. The first message looks like the one shown below.



Next a dialing message is displayed.



If the connection attempt succeeds, a connection message similar to the sample below is displayed (the actual wording depends on the modem being used):



When a problem occurs during the connection attempt, a dialing status message is displayed. The possible dialing status messages are defined below; they are listed alphabetically.

### Error occurred while dialing. Abort connection.

The attempt to connect is failing due to a dialing error. Reset the modem and try again. If you still get this message, contact the manufacturer of your modem.

# ■ Initialization command rejected by modem, please check whether the modem is supported by this tool.

The modem is not being recognizing as one supported by the Modem tool. Switch to a modem that is compatible with this tool. All Apple Modems and most Hayes-compatible modems will work with the Modem tool. <<See XXXXX for a list of any exceptions.>>

### ■ Modem not responding, please check modem connection.

The modem is not responding to communications from SampleComm. Make sure the modem is switched on; double-check the physical connection to the modem.

### ■ No dial tone detected, [descriptive message]

The phone is not dialing; it may not be connected properly or it may be broken.

### No phone number available. Please enter phone number:

You have forgotten to enter a destination phone number in the text field for the Dial Phone Number option. Enter the phone number. Click OK to continue the attempt to open the connection or click Cancel to terminate the attempt.

## No silence detected when dialing a system not providing a dial tone:

You have entered a phone number that includes an at sign (@), which means that the modem needs to detect a silence (a period of no noise) on the line before continuing to dial. The modem is not detecting this silence, so the connection attempt is terminating. The lines to the remote system may be busy; try again later.

# ■ Remote system did not answer, [descriptive message]

The remote system is failing to answer. Possibly the remote modem is not in the answer mode.

# ■ Remote system was busy, [descriptive message]

You can't establish a connection because all of the available lines to the remote system are in use; try again later.

#### ■ Wait for call command reject. Abort connection.

The modem cannot accept the "wait for call" command sent by the Modem tool; confirm that the kind of modem you are using is supported by the Modem tool. All Apple Modems and most Hayes-compatible modems will work with the Modem tool. <<See XXXXX for a list of any exceptions.>>

#### Wait for call timeout.

The connection attempt is terminated because an incoming connection request was not received within the specified length of time <specified by what?>. The remote system may be too busy to respond fast enough; try again later.

#### ■ Waiting for call.

The modem is entering the "wait for call" mode; it is waiting for an incoming connection request.

### Trouble-shooting hints

Most problems that you encounter while using the Modem connection tool are caused by mismatched communications parameters—the settings that you have chosen do not match the settings of the computer with which you are attempting to communicate. If the data being transmitted arrives garbled, compare the setting for the communications attributes. Keep in mind, that the problems could also be caused by mismatched settings for the terminal emulation tool or the file transfer tool that you are using.

Sometimes you'll have difficulty getting the connection started at all. One of the more common problems between personal computers trying to communicate is getting the connection between the modems established, particularly between an Apple modem and another type modem. You and the person handling the remote computer must be sure you both have the correct cables, that the cables and the telephone lines are properly plugged in, and that the modem switches are set correctly.

"Noise" or static on the telephone lines is another common problem you'll encounter when communicating by modem to any other computer. Noise can cause garbled data or any number of other problems. If you think that there is too much noise on the line, try disconnecting and reinitiating the connection in hopes of establishing a better connection.

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# Part III File Transfer Tools

This part of your guide describes the file transfer tools that accompanied your SampleComm application. A file transfer tool lets you implement the protocol for sending data to and receiving data from a remote system, such as a mainframe computer or an information service. A file transfer protocol represents an agreement between two computers about how they will exchange data. The modules in this part of your guide describe how to set up your Macintosh to communicate using the following file transfer protocols:

Text the simplest form of file transfer; provides a fairly

reliable way to transfer data, however does not offer

error-checking

XMODEM a file transfer method that includes error checking and

correction; several variants are currently supported by SampleComm (MacBinary, MacTerminal 1.1, Straight

XMODEM, and XMODEM Text)

The discussions for each of the file transfer tools provide the following information:

- an overview of the file transfer protocol
- descriptions of the configuration options used to set up you Macintosh to transfer and receive data using the file transfer protocol
- sample status screens
- trouble-shooting hints

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# **Text File Transfer Tool**

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The Text File Transfer protocol is used for the simplest form of file transfer. It is used to send files that contain only text, a sequence of ASCII characters, typically without any information about format or font. The Text File Transfer protocol provides a fairly reliable way to exchange information between computers, however it does not provide error checking, so if there's an error in transmission, the error won't be corrected or pointed out.

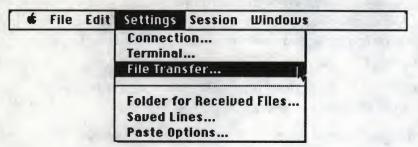
Text file transfer serves as the lowest common denominator of file transfer protocols. Some applications documents are automatically saved as Text files, for example MPW documents <<re>reviewers</r>: can you suggest an example that would be familiar to readers>>. In addition, many Macintosh applications give you the option of saving a document as a Text file. For example, MacWrite® has a Text Only button in its Save As command, and MultiPlan has a SYLK button that allows you to save a file as text only. You can use the Text File Transfer protocol when transmitting to a remote computer that can receive only ASCII files and that does not support any of the other protocols.

The following pages provide details about the Text file transfer tool.

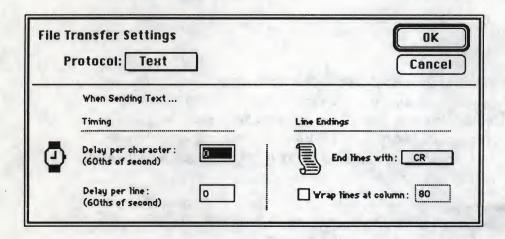
Note: The Text file transfer tool can only be used to send a file. To receive a Text file, you can use the Straight XMODEM or the XMODEM Text variations of XMODEM that are available with the XMODEM file transfer tool (see the next module in this binder).

# Text file transfer settings

You choose the File Transfer command from the Settings menu (shown below) to access a dialog box that lets you set the file transfer protocol attributes.



When you choose Text from the Protocol pop-up menu in the File Transfer Settings dialog box, the dialog box displays the setup options for configuring you Macintosh to send a file using the Text File Transfer protocol (see below).



### Setup options

For each option in the Text File Transfer setup dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings, depending on the type of file being transmitted or on how the application on the receiving computer will use the file. In these cases, you should refer to documentation for the receiving application or contact your system's administrator for information on how the various options should be set for the type of file transmission you are performing.

The following subsections describe the Text file transfer setup options. The options are presented in order as they appear in the dialog box (moving from top to bottom and from left to right).

When Sending Text... << Would it be possible to reword this so that it will be obvious to the users that the Text protocol is for <u>sending</u> only?—I don't think it is clear as is—the "when" makes it incomplete—even saying "For Sending Text" or "For Sending Text Only" would help—Actually, I would be more comfortable if it read something like-"This protocol is only for sending Text files"—as it is, I feel like I have to explain it to the reader, but there is no like element in any of the other tools, so I would prefer not to—also is the use of ellipses O.K. in terms of the human interface guidelines?>>

#### **Timing**

The two options in this group let you specify transmission delays: between characters and between lines. You use these options when you are communicating with a computer that can't receive data as fast as the Macintosh is sending it. If you can't adjust the baud rate being used for communication (either, because you don't have direct access to the remote computer or because the other computer will not tolerate the required changes to the baud rate), you can slow down the rate at which data is sent, thus preventing data loss, by setting transmission delays.

The Delay Per Character option is used in conjunction with the Delay Per Line option to control the flow of data. Try experimenting with the delays until you find a setting that works—that is, that ensures that the data is delivered intact. Start by setting the delay between lines and then try adjusting the delay between characters.

#### Delay per character

This option lets you specify a delay period between characters being sent to another computer. Delays are specified in 60ths of a second and may range from 0-32767. The default for this option is no delay (0).

#### Delay per line

This option lets you specify a delay period between lines being sent to another computer. Delays are specified in 60ths of a second and may range from 0-32767. The default for this option is no delay (0).

#### Line Endings

The two options in this group let you determine how line termination is handled during file transfer.

#### End lines with

You use this pop-up menu to specify which character(s) are sent to indicate the end of a text line. In Macintosh files, a carriage return character is used to indicate a line end; in this case, the carriage return causes the cursor to move back to the first column, as well as to move down to the next line. Since the receiving application may or may not interpret the carriage return character in the same way that the Macintosh interprets it, this option allows you to specify what character(s) should be sent when a carriage return is encountered in the outgoing Text file. To set this option, you need to know how the receiving application interprets end-of-line characters.

CR & LF	Both a carriage return character and a line feed character are sent to indicate the end of the line. Use this option when the remote application interprets a carriage return only as directions to move to the beginning of the line and a line feed only as directions to move down a line.
LF	Only a line feed character is sent to indicate the end of the line. Use this option when the remote application interprets a line feed character as directions to move to the beginning of the next line.
CR	Only a carriage return character is sent to indicate the end of a line. Use this option when the remote application interprets a carriage return character as directions to move to the beginning of the next line.

The default setting for terminating lines is a carriage return.

#### Wrap lines at column

When this option is checked, you may specify the column where you want the lines in the outgoing file to break. You may need to do this when the receiving application has a line limit that is less than the line length in the file that you are sending.

The line lengths are unchanged during file transmission.

During file transmission, lines are broken at the specified column; the cursor and the last word that won't fit wrap to the beginning of the next line; lines break between words rather than between characters. (A word is any group of characters separated from other characters by at least one space.)

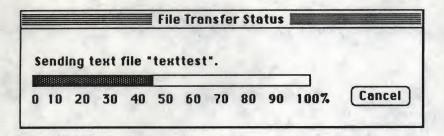
The default setting for line breaks is after the 80th character.

♦ Note: If you've inserted carriage returns in the text to create narrower margins, the lines will break where you inserted the carriage returns.

The default setting for this option is unchecked.

### Status screen

During file transfer, a status screen (like the one shown below) informs you of the progress. You can use the Cancel button if you need to interrupt the file transfer process.



# Trouble-shooting hints

If you are unable to send a file, you should confirm the following:

- your Macintosh and the remote computer are using the same file transfer protocol
- your connection is open—if the Open Connection command on the Session menu is not dimmed, your connection is not open, so you need to choose Open Connection
- all the cables are properly connected

When a file is not being received intact, you should check that the setup options that you have chosen match the settings of the computer that is receiving the file. Keep in mind, that the problems could also be caused by mismatched settings for the terminal emulation tool or the connection tool.

If your settings match those of the remote computer, but characters are still lost during transmission, you may need to reduce the baud rate or to set the handshaking protocol differently. (Remember, the setting for the remote computer will need to be adjusted accordingly). Another way of slowing down transmission to prevent data loss is to increase the delay per line or the delay per character.

# **XMODEM File Transfer Tool**

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The XMODEM File Transfer protocol was developed by Ward Christensen. It provides a method to transfer data between two computers that includes error checking and correction. XMODEM protocol is an agreement to send data and to keep on sending data until it gets there, while also checking errors to make sure that files arrive intact.

The XMODEM tool supports the following variations of XMODEM file transfer:

- MacBinary
- MacTerminal 1.1
- Straight XMODEM
- XMODEM Text

The first few sections in this chapter describe these four XMODEM methods. The rest of the chapter provides details about the setup options used with XMODEM file transfer.

# **MacBinary**

MacBinary is a variation of the XMODEM File Transfer protocol that can be used to transfer any Macintosh file (a document, an application, or a system file) to or from any computer that also supports the MacBinary variation of the XMODEM protocol. The XMODEM tool's MacBinary method supports both MacBinary I and MacBinary II. (MacBinary II provides extensibility to the MacBinary protocol and better support of the Finder™ information flags.)

You can use MacBinary to transfer files from a Macintosh to an information service, such as CompuServe, where the file can be accessed by yet another remote computer that also supports the XMODEM protocol.

The MacBinary method is very similar to the MacTerminal 1.1 method; however, it handles transmission of the Finder information block differently since it sends a file as one transmission unit (rather than breaking the file into three separate transmission units, as is the case with MacTerminal 1.1).

Also unlike with MacTerminal 1.1, with MacBinary, file receipt is not transmitter-initiated; you must choose the Receive File command from the Session menu in order to receive a file with MacBinary.

As with the other XMODEM methods, to send a file with MacBinary, you use the Send File command from the Session menu.

### MacTerminal 1.1

MacTerminal 1.1 is a variation of the XMODEM File Transfer protocol that is typically used when the remote computer is another Macintosh that also has its file transfer protocol set to MacTerminal 1.1. This protocol can also be used when the remote computer is a non-Macintosh computer that is running a program that can send and receive files using MacTerminal 1.1. (On many UNIX systems, there are local applications such as macput and macget that support the MacTerminal 1.1 method.)

When a Macintosh data file is sent using the MacTerminal 1.1 method, the file is split into three units—the data unit, the resource unit, and a Finder information unit. The units are transmitted serially (one after the other)—reception of the file involves receiving the three units and combining them into a single Macintosh file.

As with the other XMODEM methods, to send a file you use the Send File command from the Session menu. However, unlike with the other XMODEM methods, you do not have to choose the Receive File command from the Session menu in order to receive a file with MacTerminal 1.1; file receipt is transmitter-imitated (that is, with this method of file transfer, sending the file causes the receiving computer to go into file reception mode, so there is no need to use the Receive command).

Note: When the receiving computer does not support MacTerminal 1.1, sending a file from the Macintosh does not cause the remote computer to go into a file reception mode. In this case, file reception on the remote computer must be initiated *prior* to sending the file on the Macintosh end.

# Straight XMODEM

Straight XMODEM is a variation of the XMODEM protocol that can be used to transmit just the data portion in a file, typically, without the formatting information. This method is used if you want to transfer data (the data fork), but do need to transfer resources (the resource fork).

The Straight XMODEM method is similar to the XMODEM Text method, however you can transmit any type of file (the XMODEM Text method is strictly for Text files). With the Straight XMODEM method, no provisions are made for converting the end-of-line delimiters. Since various computers (and applications) recognize different characters as end-of-line delimiters, it is possible that the receiving computer will not be able to recognize the end-of-line delimiters in the file that is transferred via the Straight XMODEM, so the line format in the file will be lost.

As with the other XMODEM methods, to send a file via the Straight XMODEM method, you use the the Send File command from the Session menu. Similarly, you choose the Receive File command from the Session menu in order to receive a file with the Straight XMODEM method.

### **XMODEM Text**

The XMODEM Text method is used for transferring Text files. This method can be used for file transfers with computers that support the XMODEM protocol but that do not understand the end-of-line delimiters in a Macintosh file. Like the standard Text file transfer protocol, the XMODEM Text method converts the end-of-line delimiters during file transfer. In addition, the XMODEM Text method provides error checking that is not available with the standard Text file transfer protocol.

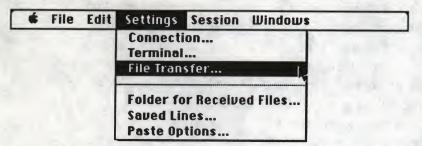
Macintosh Text files use a carriage return to delimit lines. However, many non-Macintosh computers use carriage return/line feed pairs to terminate lines. Unless provisions are made for these differences, the line format is lost when a Macintosh Text file is received by a non-Macintosh computer that uses the carriage return/line feed combination to delimit lines rather than just the carriage return. With the XMODEM Text method the line format is preserved:

- when you send a Text file, the carriage return is converted to a carriage return/line feed pair
- when you receive a file, the carriage return/line feed pair is converted to a carriage return

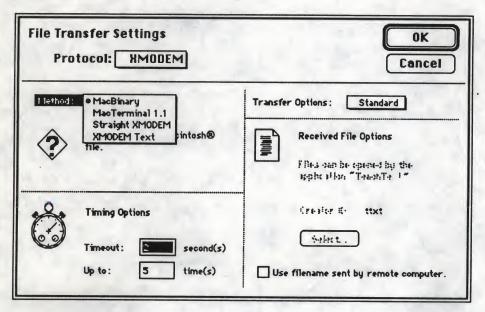
As with the other XMODEM methods, to send a file via the XMODEM Text method, you use the the Send File command from the Session menu. Similarly, you must choose the Receive File command from the Session menu in order to receive a file with the XMODEM Text method.

# XMODEM file transfer settings

You choose the File Transfer command from the Settings menu (shown below) to access a dialog box that lets you set the file transfer protocol attributes.



When you choose XMODEM from the Protocol pop-up menu in the File Transfer Settings dialog box, the dialog box displays the setup options for configuring your Macintosh to send or receive a file using one of four XMODEM protocol variations. The dialog box includes a Methods pop-up menu from which you can choose the specific XMODEM method that you will be using (see below).



# Setup options

When you select the variation of XMODEM protocol that you want to use from the Method popup menu, the dialog box displays the setup options for configuring your Macintosh to transfer and receive files using the chosen XMODEM variation. For each of the options in the setup dialog box, the most commonly used setting is preset as the default. However, you may need to change some of these settings, depending on the type of file being transmitted or on how the application on the receiving computer will use the file. In these cases, you should refer to the documentation for the receiving application or contact your system's administrator for information on how the various options should be set for the type of file you are transmitting.

The following subsections describe the XMODEM file transfer setup options. The options are presented in order as they appear in the dialog box (moving from top to bottom and from left to right). Some options apply to one XMODEM method but not to another; these cases will be noted in the descriptions.

#### Method

You use this pop-up menu to choose the variation of XMODEM that you will be using for file transfer. The options that are available in the dialog box will change based on which of the methods you select. The help message below the Method menu also changes; providing you with a brief summary of the particular XMODEM method that you are using.

Method:

MacBinary



Transfers entire Macintosh®

The MacBinary method is used to transfer any Macintosh file (a document, an application, or a system file) to or from any computer that supports the MacBinary variation of XMODEM protocol.

Method:

MacTerminal 1.1



Transfers entire Macintosh® file, with automatic file reception.

The MacTerminal 1.1 method is used for Macintosh-to-Macintosh communication or when the remote computer is a non-Macintosh computer running a program that can send and receive files using the MacTerminal 1.1 variation of XMODEM.

Method:

Straight XMODEM



Transfers data file without converting line endings.

The Straight XMODEM method is typically used by programmers to transfer just the data portion of files; this method may not preserve document format.

Method:

XMODEM Text



Transfers data file, converting line endings between computers.

The XMODEM Text method allows you to use error-checking when sending a Text file, as well as preserve the line breaks in the file.

MacBinary is the default XMODEM method.

#### **Timing Options**

You can use the two options in this group to regulate retransmission attempts.

#### Timeout ... second(s)

This option determines the length of time (in seconds) that the transmitting computer waits before retransmitting a block of data that has not been acknowledged by the receiving computer. The value can range from 0-32767; the default is 2 seconds.

#### Up to ... time(s)

This option determines the number of times the transmitting computer will attempt to retransmits a block of data that is not being acknowledged by the receiving computer. The value can range from 0-32767; the default is 20 times.

#### **Transfer Options**

This pop-up menu lets you define the size of the blocks transmitted and the type of error-checking performed. It also includes a CleanLink selection, which provides enhanced throughput.

♦ Note: The transfer options used for a particular file transfer are determined by the transfer options currently selected on the receiving computer, rather than by the those of the sending computer.

In general, XMODEM error checking can be accomplished in one of two ways: through the additive scheme or through Cyclic Redundancy Checking (CRC). With the additive scheme, an extra byte, called a checksum, is added to each block and the receiving computer uses this byte to calculate whether or not the block was transmitted accurately. If the calculations match, the receiving computer sends an ACK to the transmitting computer, who responds by sending the next block of data. If the calculations do not match, the receiving computer sends a NAK to the transmitter to request that the block be retransmitted. With the CRC method, the procedure is the same, but two bytes are used for the checksum, thus increasing the accuracy of the error checking.

Standard

Data is transmitted in 128-byte blocks with simple additive checksums; no CRC checking is performed.

CRC-16

Data is transmitted in 128-byte blocks using the CRC-16 algorithm to detect errors.

1K Blocks

Data is transmitted in 1K blocks, except when the remaining data is less than 1K (at this point, 128-byte blocks are used to finish off the transfer). The CRC-16 algorithm is used for error checking.

CleanLink

Data is transmitted in 1K blocks using the CRC-16 error-checking technique, but transmission speed is increased because the CleanLink technique is also used.

CleanLink improves throughput on error-free data links, such as links using error-correcting modems or the AppleTalk Data Stream Protocol (ADSP) and links within packet-switched networks. The transmission speed increase results from the fact that ACKs are not transmitted when packets are received. If the receiving computer detects an error, it transmits a CANCEL; when the transmitting computer receives a CANCEL, it aborts the file transfer.

The default for this option is Standard.

### **Received File Options**

The options in this group allow you to define certain file receipt attributes. Depending of which of the XMODEM methods you are using, one or the other of these options will be available.

#### Creator ID

This option lets you specify which application should be launched when the file (received via the XMODEM Text method or the Straight XMODEM method) is opened from the Finder. The *Creator ID* is a 4-character identifier. To specify the Creator ID, you may either enter the 4-character identifier in the text field or choose the SELECT button and then use the dialog box that appears to locate the appropriate application and then either double-click on it or choose the OPEN button; instead of the application (or file) opening, its Creator ID code appears in the configuration dialog box. <<Should I show the screens for this?--we are assuming our audience is familiar with using applications on a a Macintosh, so I am thinking I don't need to--Reviewers: What do you think?>>

The default Creator ID is ttxt.

♦ Note: The Creator ID option is available only when using XMODEM Text or Straight XMODEM. With the MacBinary and MacTerminal 1.1 file transfers, the 4-character Creator ID code is specified within the file being transferred.

#### Use filename sent by remote computer

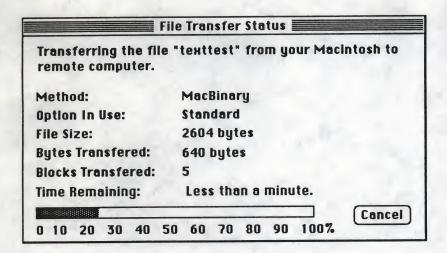
The settings for this option determine whether the received file is saved automatically with the default filename assigned by the sending computer. This option is available only with the MacBinary and MacTerminal 1.1. methods.

When file transmission is complete, the user is prompted to name the file and then save the file by choosing the Receive button in the dialog.
When file transmission is complete, the file is saved automatically with the default name the user is not prompted to name the file.

The default setting for this option is unchecked.

### Status screen

During file transfer, a status screen (like the one shown below) informs you of the progress. You can use the Cancel button if you need to interrupt the file transfer process.

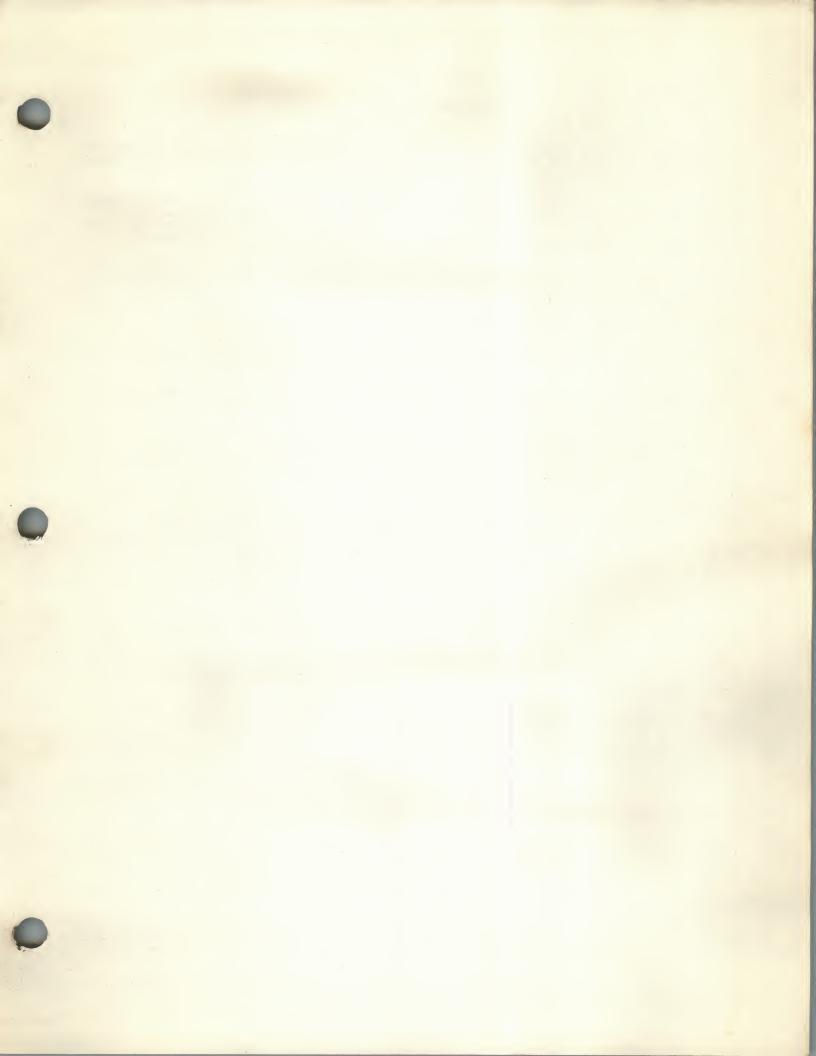


# Trouble-shooting hints

If you are unable to send a file, you should confirm the following:

- your Macintosh and the remote computer are using the same file transfer protocol
- the remote computer supports the XMODEM variation that you are using
- the remote computer supports the error-checking method you have specified under Transfer Options
- your connection is open—if the Open Connection command on the Session menu is not dimmed, your connection is not open, so you need to choose Open Connection
- all the cables are properly connected

When a file is not being received intact, you should check that the setup options you have chosen match the settings of the computer that is receiving the file. Keep in mind, that the problems could also be caused by mismatched settings for the terminal emulation tool or the connection tool.



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